THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

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LESMAHAGO GAS COAL.

JAMES FERGUSON and CO., Lessees of the Auchinheath and Craignethan Gas Coal-fields (the most extensive and valuable in the parish of Lesmahago), respectfully intimates to the Managers of Gas Works and Consumers of Gas Coal, that he is prepared to ship the best quality of the above well-known COALS at Glasgow or Leith; and also to deliver them at the railway stations upon, or connected with, the Caledonian Railway, to any extent which may be required.

Price, free on board, or delivered at the railway stations, may be learned by addressing James Ferguson and Co., Gas Coal Works, Lesmahago; or J. H. Jones, 1, Poets'-corner, Westminster, sole Agent for London.

CARDIFF GASLIGHT AND COKE COMPANY.
TO IRON FOUNDERS.

THE DIRECTORS of the Company are prepared to receive TENDERS for about 2000 yards of CAST-IRON SOCKET PIPES, of 12 inches, 6 inches, 4 inches, and 3 inches, internal diameter. Specifications and particulars may be obtained upon application at the Company Offices, Cardiff.

Sealed tenders, addressed to the Chairman of the Directors, to be forwarded, under cover, to the ENGINEER of the works, on or before the 9th day of April next, endorsed "Tenders for Pipes." The lowest or any tender not necessarily accepted.

By order, HENRY BOWEN, Engineer.
Cardiff, March 26, 1856.

PADDON AND FORD,
PATENT GAS METER & APPARATUS WORKS,
GRAY'S-INN-ROAD, LONDON,
Manufacturers of WET and DRY GAS METERS, STATION METERS, GOVERNORS, EXPERIMENTAL APPARATUS, GAS STOVES, and LANTERNS.

Contractors for the erection or alteration of Gas Works; and every description of Apparatus required in Gas Works supplied.

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Contracts made for all kinds of Cast and Wrought Iron Gas and Water Apparatus, Clay Retorts, Fire-Bricks, Coals, &c.—Prices, and Lists of Freights and Carriage, sent on application.

THROCKLEY CLAY-WORKS,
NEWCASTLE-ON-TYNE.

WILLIAM STEPHENSON and SON

Beg to intimate that they have erected extensive Works for the MANUFACTURE of every description of GAS RETORTS, FIRE-BRICKS, LUMPS, &c.

The Clay having been proved (by analysis and the application of extreme heat) of FIRST-CLASS quality, they can confidently recommend it.

UNEXCEPTIONAL REFERENCES given, and orders NEATLY and QUICKLY EXECUTED.

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WANTED to Purchase, a Station- GOVERNOR, with 10-inch inlet and outlet, to replace one with 6-inch connections; the latter to be sold cheap.

Persons desirous of supplying the new Governor are requested to send plans and specifications, with the price delivered at Dover, to

March 25, 1856. R. H. JONES, Secretary.

WANTED, a Wet-Lime Purifier, with gear complete, of about 8 feet diameter, and 3 feet deep.—Address, J. and J. MEAD, Penryn, CORNWALL.

TO GAS COMPANIES AND OTHERS.

THE Advertiser, who has had 20 Years' experience in Gas-works, Main-laying, and Gasfitting, and has a thorough practical knowledge of Reading, Cleaning, and Adjusting Meters, and has been sole manager of the Oakham Gas Works for the last six years, is anxious to engage as MANAGER or SUB-MANAGER, INSPECTOR, &c.—Address, WILLIAM VICKERY, Manager, Gas Works, OAKHAM.

WILLIAM RICHARDSON & CO.,
ENGINEERS, IRONFOUNDERS,
AND
CONTRACTORS
for the Erection, Enlargement, and Repair of
GAS & WATER WORKS,
No. 84, CHARLES-STREET, CITY-ROAD,
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WORKS:
Tunnel Foundry and Iron Works, DUDLEY.

COWEN'S PATENT FIRE CLAY RETORTS.

JOS. COWEN and CO.,
BLAYDON BURN, NEAR NEWCASTLE-ON-TYNE,

Were the only parties to whom a PRIZE MEDAL was awarded at the GREAT EXHIBITION of 1851, for "GAS RETORTS and OTHER OBJECTS in FIRE CLAY."

J. C. and Co. have been for many years the most extensive Manufacturers of Fire Clay Retorts in the United Kingdom; and orders for Fire Clay Retorts of all shapes and dimensions, Fire Bricks, and every other article in Fire Clay, are promptly executed at their works as above.

Also, owners of BLAYDON BURN COLLIERY, from which "COWEN'S CANNEL COAL," extensively used in Metropolitan and other Gas Works, and "COWEN'S GARESFIELD COAL," are obtained. From the latter, "COWEN'S GARESFIELD COKE" is made, the superior quality of which is well known.

Coal and Coke Office, Quay-side, NEWCASTLE-ON-TYNE.

JOHN RUSSELL AND CO.,
THE OLD TUBE WORKS,
CHURCH HILL, WEDNESBURY,
STAFFORDSHIRE,
and 69, UPPER THAMES STREET, LONDON,

Original Manufacturers of Wrought-Iron Gas Tubes, and Holders of the present Patents; Inventors and First Makers of LAP-WELDED FLUES for Boilers: have been awarded the FIRST PRIZE in the Great Exhibition of Paris for these Articles.

J. R. and Co. make all kinds of Tubes and Fittings for Gas, Steam, and Water, and the largest Orders may be executed in a few days.

The eminent Engineer, Mr. Perkins, confines himself altogether to the use of John Russell and Co.'s Tubes in High-Pressure Patents.

Gun Metal, and all other kinds of Cocks, Stocks, Dies, and Taps, Galvanised Tubes, &c.

N.B All Goods thoroughly Tested before sent out, and Warranted.

VOL. IV. of the JOURNAL of GAS- LIGHTING for 1855, is now ready for delivery, price 15s., bound in cloth and lettered. Cloth backs for binding, 2s. 6d. each. A few copies of Vols. II. and III. are also still on sale.

W. B. KING, 11, Bolt Court, Fleet Street.

TO GAS COMPANIES.

TO be Sold, Four Dry Lime Purifiers, each 13 ft. 2 in. long, by 4 ft. 2 in. wide, inside, divided into Three Compartments, with Three Tiers of Trays in each. These have only been in use since 1847, and are removed to make room for larger ones.—For particulars apply to the MANAGER, Gas Works, CARLISLE.

March 12, 1856.

WILLIAM PARKINSON & CO.
(Successors to the late Samuel Crosley),
COTTAGE-LANE, CITY-ROAD, LONDON,

Beg most respectfully to announce that, in addition to the continued manufacture of GAS METERS, they manufacture Meters for measuring Water, Spirits, &c. (commenced under Patent, in 1849, by the late Mr. William Parkinson).

N.B. These Meters are as simple and durable as the Gas Meter, and as correct as that instrument under the most careful manipulation.

TO GAS COMPANIES.

A Young Man, who has for Six Years been employed in a large Provincial Gas-Work, as ASSISTANT METER REPAIRER, is desirous of obtaining a similar situation; or he would have no objection to engage with a small Work as Meter Repairer and Inspector. Good character, &c., can be furnished from his late employers. For further particulars, address P. S., care of Mr. W. B. KING, Office of this JOURNAL, 11, Bolt Court, Fleet Street, LONDON.

TO IRONFOUNDERS.

THE Committee of the Doncaster GAS COMPANY are prepared to receive TENDERS for the undermentioned CASTINGS:—Eight lengths of Hydraulic Main, 40 Retort Mouthpieces, 40 Lids, 40 Ascension H and Dip Pipes, Sundry Furnace Doors and Frames, Buck-staves, Furnace Bars, &c. Drawings and Specification for the above may be seen on application to Mr. Henry Gore, Gas Engineer, 25, York Place, Leeds. Tenders are to be forwarded, on or before Wednesday, April 9, 1856, addressed to the CHAIRMAN, Gas Company, DONCASTER.

BLAYDON BURN AND LOW BENWELL FIRE-CLAY RETORT AND FIRE-BRICK WORKS,
NEAR NEWCASTLE-ON-TYNE.

WILLIAM COCHRAN CARR,

begs most respectfully to thank the Metropolitan, Provincial, and Continental Gas Companies for their patronage for several years past, and to intimate that he has rebuilt and enlarged his extensive premises for the Manufacture of CLAY RETORTS; and that he is now prepared to execute the largest orders with punctuality and despatch. Orders for FIRE-CLAY RETORTS, of all shapes and sizes, FIRE-BRICKS, and all other Articles in Fire-Clay, executed on the shortest notice, and on the most reasonable terms.

London Agents:
JAMES LAWRIE & CO.,
COUSIN LANE UPPER THAMES STREET.

MR. WILLIAM RICHARDSON,
CONSULTING ENGINEER,
DUDLEY.

FAIRFORD GAS WORKS.

TO be let by Tender, from Midsum- MER next. For further particulars apply to Mr. GEO. S. WHITE, the Secretary.

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TO be Sold, a number of 18-inch, 15-inch, and 12½-inch Dee-Shaped Retort Mouthpieces and Covers, with Flange-pipes to fit, being part of the surplus stores of the Woolwich Equitable Gas Company. Price £5 per ton. Apply to Mr. G. HUDSON, Secretary, WOOLWICH.

KAY'S Patent Equitable Gas-Meter. The attention of Gas Companies is requested to the above Meter as an efficient preventive of fraud by "tilting," so often resorted to by dishonest consumers. Manufactured only by WM. COWAN, 60, Buccleugh Street, EDINBURGH.

C. COULDWELL,
CIVIL AND CONSULTING GAS ENGINEER.
Office—DARLEY STREET, BRADFORD.

C. C. begs to inform Gas Companies that he continues to supply Plans, Specifications, and Estimates of Outlay, and may be consulted on all matters connected with Gas. Companies wishing to lease off their Works for a term of years may receive liberal proposals on application to C. C.

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THE Swansea Local Board of Health are prepared to Dispose of about 2000 yards of 12 to 16 inch New Cast-Iron Socket-Pipes, together with a number of Junctions and other Castings. The whole are of the best description, coated by Dr. Angus Smith's patented process, and were supplied by the eminent firm of Cochrane and Co.

For further information apply to Mr. JOHN NEWTON, Resident Engineer, Guildhall, SWANSEA.

Swansea, March 18, 1856.

MR. HENRY GORE,
CIVIL AND CONSULTING GAS ENGINEER.
OFFICE,
25, YORK PLACE, LEEDS.

EIGHTON MOOR GAS COALS.— Parties wishing to be supplied with these first-class Gas Coals will please to apply to Mr. MATTHEW NESBIT, EIGHTON MOOR OFFICE, NEWCASTLE-UPON-TYNE. These coals are well known as among the richest in gas, and working the roundest on the River Tyne. They are extensively used by metropolitan gas works.

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CONTRACT FOR LAYING WATER-PIPES.

THE Filey Water Company are prepared to receive TENDERS from parties willing to contract for LAYING about FIVE MILES of WATER-PIPES.

The Specification may be seen at the office of Mr Josiah F. Fairbank, of Scarborough, the Company's Engineer, on and after Monday, March 31, 1856.

A printed copy of the Specification, with Form of Tender, will be forwarded on receipt of 5s.

Sealed Tenders, addressed to the Directors of the Filey Water Company, and endorsed "Tenders for Pipe-laying," must be forwarded under cover to the Engineer of the Company, on or before April 10, 1856.

The Directors do not bind themselves to accept the lowest or any Tender.

JOSIAH F. FAIRBANK,
Engineer and Secretary to the
Filey Water Company.
Scarborough, March 27, 1856.

KIMBERLEY'S PATENT GAS APPARATUSES

consist of Eighty-nine patterns, sizes, and varieties of GAS HEATING STOVES, Twenty kinds of Gas Cooking Ranges, Counter, Greenhouse, Bed-room, Office, Shop, Warehouse, Church, and Hall Stoves; Lacquering, Boiling, Steaming, Stewing, Ironing, and Griding Stoves; Ovens, Baths, Liquor, Shop, and Ornamental Stoves; the whole either Black, Galvanised, or Enamelled. A new Book, just published, with 43 pages of interesting matter to all concerned in Gas, sent on application—postage one penny. The Stock includes upwards of ONE HUNDRED AND TWENTY kinds, prices, patterns, and sizes, and is the most extensive variety and stock ever attempted before. Their success continues great, as the numerous references prove.

56, & 57, INGE STREET, BIRMINGHAM.

*** Gas-Fitter and Gas-Fitting Manufacturer in every branch of the Trade, and to any extent.

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PROPRIETORS OF

BEST CLASS-HOUSE POT AND CRUCIBLE CLAY.

MANUFACTURERS OF

FIRE BRICKS, GAS RETORTS, &c.

AMBLECOTE FIRE CLAY AND BRICK WORKS, STOURBRIDGE.

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Begs respectfully to announce to Gas Companies and Fitters, that from upwards of 20 years' practical experience, he is enabled to supply a METER combining correctness, durability, and economy.

N.B.—Repairs on the lowest scale.

JAMES OAKES and CO.,

ALFRETON IRON WORKS, DERBYSHIRE, AND WENLOCK IRON WHARF, CITY ROAD, LONDON,

Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water Works, including best cold-blast iron Retorts, Socket and Flange Pipes of all sizes, Bends, Branches, Syphons, &c.; also Lamp Columns of different patterns.

London Agent, Mr. ALFRED PENNY, Engineer, WENLOCK IRON WORKS, Wharf-road, CITY-ROAD, who undertakes the manufacture and erection of gas-holders, purifiers, iron roofs, and every description of apparatus in use in gas works.

H. JONES, Gas Meter Manufacturer,

No. 44, OLD-STREET, St. Luke's, London, begs respectfully to call the attention of Gas Companies yto his latest improvements in the WET METER, b means of which water cannot be abstracted, neither can Gas by any possibility pass through the Meter without registering.

MEAD'S Improved Gas-Meters are

constructed of the best materials, the internal parts being of metal capable of resisting the combined agency of gas and water.

MEAD'S PATENT DRY GAS REGULATOR is now used by a great number of gas companies and consumers. It is simple, easily fixed, and when adjusted requires no further attention.

Phœnix Foundry and Gas Apparatus Works, 176, Great Dover Street, Borough, LONDON.

NOTICE.—Mr. N. DEFRIES, Consulting

GAS ENGINEER, begs to inform gas companies and the public, that he is desirous of meeting any gentlemen at his WORKS, NEW ROAD, ST. PANCRAS, where, under his own superintendence of the manufacturing department, they will have the fullest opportunity of investigating the many improvements he has recently effected in his ROTARY-VALVE DRY GAS-METER, by which full security will be afforded against leakage and non-registration, even against the searching effects of Cannel Coal Gas. The Rotary-Valve Meter is warranted to register inflexibly correct at a working pressure of half a tenth, and less than a quarter of a foot per hour upon a blue light; and a guarantee will be given to all gas companies to keep it in repair for not less than five years, free of expense. With this meter the gas-supplier may fully depend upon a fair return, and the public upon having a just measurer.

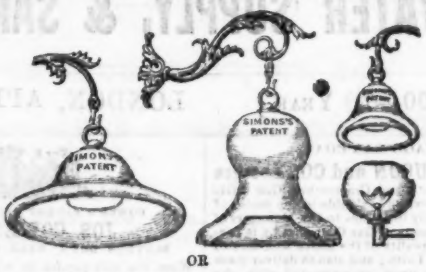
GAS BATHS, GAS COOKING and HEATING STOVES, for all classes. The British Polytechnic Gas-fire, &c. Conservatories and Buildings heated by gas, and perfect ventilation secured.

Any gentleman desirous of consulting Mr. Defries in especial cases, may meet him either at his office, 145, REGENT STREET, or at his residence, 5, FITZROY SQUARE, by giving one day's notice.

Gas-works erected for private houses, where no gas company exists.

(BY HER MAJESTY'S ROYAL LETTERS PATENT.)

SIMONS'S PATENT PERDIFUME,



OR

GAS-SMOKE CONDENSER.

EDWARD SIMONS,

LAMP MAKER TO THE QUEEN,

84, DALE END, BIRMINGHAM.

This invention is submitted to the Public as the perfection of a Gas Shade. It both condenses the smoke and absorbs the noxious vapours arising from the combustion of Gas or other illuminating agents. It thus preserves the colour of the ceiling unimpaired, and maintains the air of the room in a state fit for respiration. In ill-ventilated Rooms it is especially useful, for it withdraws the carbonic acid (produced by combustion) from the air, and prevents the headache and depression which so commonly arise from an accumulation of noxious vapour in small rooms lighted by Gas.

In Rooms sufficiently ventilated, this invention arrests the imperfectly consumed carbon, which, escaping from the flame, deposits itself on all the most delicate articles in the room, tarnishing and discolouring them.

It is hence an ever corrective of imperfect combustion or defective ventilation, immediately coming into operation when either of these evils occur; it is simple in construction, and the first cost is small. It is free from all complication, and may be safely left to the care of Servants; its current cost of working is very trifling, there being nothing more required to be used in the Condenser than a small quantity of SODA, LIME, or POTASH.

SOLE WHOLESALE MANUFACTURERS.

Messrs. BACCHUS and SONS, Glass Works, Birmingham.
Messrs. LLOYD and SUMMERFIELD, Glass Works, Birmingham.
Messrs. WINFIELD and SON, Cambridge Street Works, Birmingham.
Messrs. PALMER and Co., Sutton Street, Clerkenwell, London.

Can also be bought, Wholesale and Retail, at the Patentee's, DALE END, BIRMINGHAM, where the Condensers are constantly in use.

Price—in Glass, 2s. 6d. to 5s. each; Metal, 5s. each.

JOHN DOULTON, BROTHERS, AND CO.,

LIVERPOOL POTTERY, ST. HELEN'S.

STORES—70, SOHO STREET, LIVERPOOL.

MANUFACTURERS OF

Doulton's Stoneware Pipes.
Doulton's Half-Socket Pipes.
Doulton's Invert Blocks, for Sewer Bottoms.
Doulton's Patent Junction Blocks.

TERRA-COTTA CHIMNEY-TOPS, FIRE-CLAY FLUE-PIPES, RIDGE AND PAVING TILES, &c.

REDUCTION IN THE PRICE OF CLOSET PANS.

DOULTON AND WATTS,

LAMBETH POTTERY, HIGH STREET, LAMBETH,

Have reduced the Price of their

PATENT ENAMELLED CLOSET PANS,

WITH TRAPS, to

5s. 6d.

These Pans, therefore, which have a strong Vitrified Body as well as a White Interior Glaze, may now be obtained at the price of the commonest description of Closet Pans.

GREAT REDUCTION IN PRICE OF DOULTON'S DRAIN-PIPES.

HENRY DOULTON AND CO.

Beg to inform Builders, Contractors, and others, that they have made a considerable REDUCTION in the PRICES of their

GLAZED STONEWARE DRAIN-PIPES.

Drawings and Prices will be forwarded on application.

MANUFACTORIES: HIGH STREET, LAMBETH, LONDON; ROWLEY REGIS, STAFFORDSHIRE; and SMETHWICK, near BIRMINGHAM.

OFFICES: HIGH STREET, LAMBETH, LONDON.

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ERRATA.

In the Share List published last month, the dividends of the Chartered and Phœnix Gas Companies were quoted at 5 and 4 per cent. instead of 6 and 5 per cent., as declared at the last half-yearly meetings of the respective companies. The Chartered £50 shares have recently been sold at £57.

NOTICES.

The next number will be published on Tuesday, April 15, and the subsequent numbers on each successive alternate Tuesday, till our project of weekly publication is carried into effect.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

All Communications to be addressed to the Editor, No. 3, Parliament Street, Westminster; and orders for Advertisements to Mr. W. B. King, the Publisher, No. 11, Bolt Court, Fleet Street. Attention to these instructions is particularly requested, as letters addressed to the "Publisher of the GAS JOURNAL, London," have found their way to 122 Fleet Street, and have been opened "by mistake."

THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT

TUESDAY, APRIL 1, 1856.

NOTES ON PASSING EVENTS.

VERY little has transpired since the publication of our last number, to invest the proceedings of the Metropolitan Board of Works with the character of energetic activity the public looked for at its hands. Perhaps it was not possible to avoid such a period of hope deferred; for the preparation of the great drainage scheme, and of the documents which past experience has shown must necessarily accompany the plans, must have required long and anxious study on the part of the officers, whose recommendations will, out of doors at least, infallibly be criticised in a bitter and unfriendly spirit. That Mr. Bazalgette should have been able to prepare a work of this description in so short a time, is highly creditable to his application and business-like habits; and, indeed, it cannot but be regarded as a proof of the cordiality with which he is supported by those around him—a cordiality the more to be admired, because circumstances hardly warranted its expectation. Sincerely is it to be hoped that the same earnest desire to advance the great object before them may animate the future proceedings and deliberations of the board and of its officers, and that all preconceived notions may be laid aside—all imperfect and unfounded theories forgotten, in order that the question of the main drainage may be examined in a spirit likely to ensure the satisfactory solution of the great problem of the improvement of London. As for the purification of the Thames, it may be as well to say at once, that so long as the tide flows, and steamers maintain the water in a constant state of agitation, it is absurd to expect again to see our river, "though deep, yet clear." The sewerage may be prevented from passing into it in a foul state; but the sewerage is only one of the causes at work to produce the impurity so much complained of, and its removal will only affect the question in a very imperceptible manner.

Perhaps the most important proceeding of the board which has lately transpired was the production of the letter, dated March 10, from Sir B. Hall to the Chairman. It would appear, from this document, that the honourable member for Marylebone, the former champion of local self-government, now that he is in office, means seriously to exert the control of the central government over the proceedings of the local authorities he had so cleverly secured by the insertion of the 136th section. There would be nothing extraordinary in the enunciation of such a system in France, where all corporate bodies and municipalities are treated as minors under the guardianship of the State; but it is startling to find that we have already made such advances towards its introduction here, that Sir B. Hall should feel authorised to inform the Metropolitan Board of Works, in a letter couched in language worthy of Bilboquet, or of Mrs. Malaprop, that "all the plans that must necessarily be brought before him" should be sent not later than the end of June. In the long-winded and disgracefully worded paragraph preceding this announcement, Sir B. Hall stated, amongst other reasons, that it was one object of the clauses he quoted—so at least it appears on the face of the letter—that "the plans must necessarily require much consideration, especially as regards the great drainage works." Thus, without stopping to correct Sir B. Hall's grammar, it seems that, however the Metropolital Board may examine, discuss, and consider the great drainage works, the whole of its proceedings may be set aside by the Commissioners of her Majesty's Public Works! After the strange freaks, and the mischievous nonsense, the Government has lately identified itself with in the case of the telescopic pipe-sewers and combined back drainage, we should believe that the ratepayers would feel but little satisfaction at learning that the old man of the sea they had fondly hoped to have thrown off was as firmly seated on their shoulders as ever. Surely the Municipal Board, elected by a class of voters, possessing a property qualification at least two and a half times greater than that required for a voter for the election of a member of Parliament, ought to be competent to decide upon plans for drainage works, without the intervention of any Government officers. But such is the law; and the Metropolitan Board may possibly find itself in the same delightful position as the penultimate Royal Commission of Sewers—that is to say, they may find that Lord Palmerston, Sir B. Hall, or some other ministerial Solon, may receive a letter from some amateur engineer, suggesting a rival scheme of drainage, which, in their opinions, may be superior to the scheme eliminated after long and careful study, enlightened by the best scientific and practical knowledge of the day. Well, indeed, might the old Swedish chancellor tell his son that "human affairs were managed by very small wits!" Sir B. Hall's letter, too, brings forcibly to recollection the verse of the poet "dammed to everlasting fame" by Dean Swift. He terminates his strange epistle by a few words of politeness, as though he desired to show that he too could exclaim, "I am no scollard, but I am polite." Alas! *on n'est jamais trahi que par les siens!*"

The principal of the independant action of a municipal body, organised for a definite purpose, appears to us to be of such importance, that all the minor considerations of the men who may be called upon to act in any of these matters shrink into utter insignificance. Sir B. Hall, or even Lord Palmerston himself, may personally be passed over in silence; but it behoves every Englishman to resist the introduction of a system which would practically place the control of public affairs of the minutest description in the hands of the Central Government, and would place the corporations of the country entirely at the mercy of the Minister of the day, Corporate bodies may commit blunders, and have often, no doubt, done so, in a manner seriously to affect the interests of their constituents; but the disgraceful jobbery and the notorious failures which have characterised the proceedings of the General Board of Health, must convince any reasonable person that there is no security from the recurrence of such errors in the supervision of a practically irresponsible Government Board; nay, rather, it has been proved that the real interests of any nation

which is capable of governing itself are most surely advanced by leaving it free from the trammels of a bureaucracy. If Sir B. Hall's letter should rouse public attention to the very serious questions it involves, it will render a service of incalculable value. Most urgently, therefore, do we call upon the members of the Metropolitan Board to consider the real extent of their powers—the real nature of their position. It is more essential to weigh the eventual consequences of a system such as it is now proposed to establish, than the present form and manner given to it.

In the recent "able reports" (to use the stereotyped phrase) of the district medical officers, we have been struck with the parrot-like repetition of certain dogmas of the leaders of the Samaritarian sect. It appears that we are shortly to enter upon a course of social intervention in the lodging and washing of our fellow-citizens, as we have already done in the gas and water supply, and are likely to do in the matter of food, if this mischievous tendency to substitute the paternal care of the Central Government for individual exertions be not soon put a stop to. Unfortunately, there is too much reason for attacking the neglect of duty by the proprietors of house property inhabited by the very poor; but the most efficacious remedy to these evils will be found to be in the improvement of the education of the poor people themselves, "Model lodgings" hitherto have not touched the real difficulties of the case, which consist more in the improvement of the dwellings of the very poorest and most depraved, than in furnishing cheap and commodious lodgings for those who are in fact able to protect themselves. Even in the matter of the baths and washhouses, it may fairly be questioned whether the public ought to be taxed for the special benefit of any one class. It is in vain to say that these institutions are self-supporting; for the result of their operations has been, on the average, to leave a charge upon the parishes where they are established. It may be policy to incur such a charge; but the public ought to know that the execution of works of this description is only part and parcel of a system similar to that which led to the establishment of the *Thermæ* and the *Circi* of ancient Rome—a system which degraded the citizens of that marvellous state eventually to that degree that they rested contented with the "*panem et circences*" with which their tyrants bribed them to silence. In all these matters "God helps them who help themselves." The interests of the poor, the sanitary improvement of our cities, will be more surely advanced by teaching men to act and think for themselves, and by restraining the action of society within the very narrowest bounds. Good employment, and cheap food, will do more to diminish the rate of mortality than the erection of baths, washhouses, and model lodgings. The advocates of free trade are, after all, the best sanitary reformers. The guns now ringing in our ears, announcing the glad-tidings of peace, promise more for our social and moral improvement than all the paper pellets of the sanitary agitators—who, by the way, we would add, appear all to have succeeded in securing place and pay for themselves.

In the meantime, we would recall attention, amongst the other absurdities of the day, to the Vaccination Bill, as illustrating the mischievous tendency of the style of legislation lately adopted. By clause 30, it is proposed to punish any person who may practice innoculation by one month's imprisonment. Eighty years ago, if the medical profession had been consulted, the same punishment would have been awarded to those who did not innoculate. Is not the moral to be drawn from this tolerably evident? Why legislate in matters which are still in uncertainty? Why, at any time, compel people to do that which they would do infinitely better if left to their own responsibility?

VISITS TO THE LONDON WATER-WORKS.

The establishments of the Chelsea and the Lambeth Water-works' Companies are upon so grand a scale, and they present some such remarkable peculiarities, that it appeared advisable to return to their examination. In the first place, they are worthy of such special notice, because the details of the pumping machinery have been studied by Mr. Simpson with the most scrupulous care; and, in the second place, because the above-named establishments present this remarkable difference from the other works upon the upper Thames—that they pump water directly from the filters on the banks of the river to the mains and the reservoirs. Of course it was impossible for the West Middlesex, Southwark, and Grand Junction Companies to remove or abandon the enormous pumping-works and filter-beds they had previously possessed near town; but the fact of the Lambeth and Chelsea Companies' having concentrated all their operations upon the spot where they derive the water itself, enables them to dispense with the intermediate establishments the other companies have been compelled to form; and this must make a considerable difference, we should imagine, in the working expenses of the various companies.

It would be almost impossible, in a mere description of an engine, unaccompanied by illustrations, to do justice to the mechanical skill of the arrangements of the pumps and valves of the engines already at work for the Lambeth Company, or to the arrangements by which the steam is made to exercise its effect in the two cylinders, so as to exercise a power so nearly equal in both of them as to appear to solve satisfactorily the most difficult problem in the construction of the compound cylinder engines. In the Chelsea engines, a little modification is being made in the introduction of the steam, for the purpose of securing its arrival in the cylinder in a dry state, which is worthy of notice; and there is in both cases an almost imperceptible modification of the pump barrel, by means of which it is made to act partially as an air-vessel, and thus contribute to ensure the regularity of delivery. It is in these and such minute details that the practical excellence of the Chelsea and Lambeth engines may be recognised; and it is in consequence of the careful manner in which they have been studied, as well as of the conscientious way in which they have been carried into execution, that we are induced to anticipate such favourable results from the working of these establishment. Notwithstanding our theoretical preference of the Cornish engine, we must confess also that there is an advantage in the system adopted by Mr. Simpson in this respect, that, when it is desirable to increase the rate of delivery, the speed of the engines can be more easily increased than is the case with the Cornish engines; and, moreover, as the weight of the pole in the latter description of machine must be equal to that of the maximum load, a great deal of power may at times be wasted—that is to say, whenever the draught upon the mains is not sufficient to require the full supply. Of course this inconvenience may be, and is, susceptible of modification; but, either from inattention or indifference, working men are apt to neglect the observance of minute care in matters wherein they have no direct interest; and it is to be feared that the variable load of pumping establishments must often complicate the economical results of the engines employed. It would be very desirable if the London Water-Works' Companies were to publish the cost of the working and repairs of their engines, as compared with the quantities of water distributed, and with the districts supplied, so as to enable a really valuable comparison to be made between the various systems they have adopted. The usual modes of estimating "duty" remind us forcibly of the definition of statistics, which was said "to be the science of grouping figures so as to disguise truth;" they have so little reference to the actual working value of engines as to be comparatively useless.

In our notice of the Lambeth and Chelsea works (page 119), we did not mention that the area of the filter-beds of the former company was about 32,000 feet; whilst the filter-beds of the Chelsea Company have an area of about 2 acres, and the depositing reservoirs are nearly 4 acres superficial. In the case of the Chelsea Company it is also important to observe, that in consequence of the peculiar nature of the district it supplies—for that district comprises the ornamental waters of the Serpentine and St. James's Park, and a part of the metropolis in which the street watering is more attended to than in any other—it has been necessary to provide water for those special requirements. Two of the old engines, 25 horses' power each, are proposed to be removed from the existing establishment at Thames Bank, for the purpose of forcing the water directly from the river, without filtration, through a 15-inch main, to an uncovered reservoir at Putney Heath. The diameters of the mains for the filtered water are 33 and 30 inches respectively: they lead also to two reservoirs on Putney Heath, which are covered by means of cross-walls and arches, so as effectually to exclude light or atmospheric impurities. The united capacity of the covered reservoirs is such, that they are able to store 15 million gallons; the capacity of the uncovered reservoir is 3,000,000 gallons; and the height of the water-line is 165 feet above Trinity Datum.

The Lambeth Company have constructed already two

covered reservoirs for the supply of their district. One of these is at Brixton, at an elevation of 110 feet, and with an area of about 3 acres; the other is at Streatham, at an elevation of about 185 feet, and of an area of about 1½ acre. They have likewise purchased a piece of land at Rock Hill, near the Crystal Palace, at a total elevation of 360 feet above datum, for the purpose of constructing a reservoir for the requirements of the rapidly increasing district of Norwood, Sydenham, and Penge, at present so imperfectly supplied by wells or surface springs. It is calculated that, by the time these works shall be completed, the total outlay of the Lambeth Company, for the improvement of its distribution of water, will not amount to less than £300,000; whilst that of the Chelsea Company, for the same purpose, will not fall short of the enormous sum of £400,000. It would be long, indeed, ere a municipality could be induced to make such sacrifices to improve its water supply, having already one of a tolerable character; and we cannot avoid dwelling upon this convincing proof of the advantages of leaving all such matters in the hands of private parties, who are willing, or at least can be made, to keep pace with the wants and requirements of our continually advancing civilisation.

Before leaving this part of our subject, we would observe that Dr. Odling, the young and newly appointed medical officer of the Lambeth district, has issued a report on the sanitary state of that part of the metropolis, which rivals in the "fustian" of its language, and its absurd assumption of philosophy, even the wonderful productions of his worthy colleague, Dr. Waller Lewis. It is not our intention here to enter into a detailed examination of Dr. Odling's trashy, commonplace declamation, reserving it for some other occasion; but we cannot refrain from calling attention to the fact, that the analysis he gives of the Southwark Company's water differs from that given by the medical officer for Marylebone, of the waters of the West Middlesex and Grand Junction Companies, although the three companies derive their supply from precisely the same source. Now, it is very probable that all the various analyses which have been given of the London waters are correct; but the mischief which is done by the publication of such documents, unaccompanied by explanation, consists in this, that the public take them to represent the constant state of the water supplied, whereas they are only strictly true of the precise sample examined. It would be necessary to examine the waters of any river day by day, and almost hour by hour, to form correct opinions as to their quality; in any town supply it is also necessary to take into account the causes of deterioration which are beyond the control of the companies. Yet the new race of philosophers, who have been called into existence to frighten us into the belief that we are surrounded by unnumbered causes of death and disease we have hitherto obstinately persisted in supporting with ease and comfort; this new race, we say, contents itself by examining one gallon of water, and proceeds forthwith to characterise a supply, consisting of many million gallons per day, according to the results of such single experiments. The public, moreover, sees a long array of figures, accompanied by imposing scientific names, and dwells with a vague feeling of uneasiness upon the assertion, that there are from 20 to 22 grains of impurity in a gallon of water; but it would only be fair to remind the public that the gallon weighs 70,000 grains avoirdupois, so that the proportion of impurity of every description is only about 1 in 3500; and the organic impurity—whether arising from causes within, or beyond, the control of the companies—does not exceed 1 in 17,500, in the most unfavourable cases cited by Dr. R. D. Thomson. Everybody ought to know that the inorganic impurity cannot be separated by mechanical means, and therefore the dwelling upon its amount in the Thames water is now a mere pedantic display of scientific accuracy, which can in nowise affect the real question of the quality of the supply afforded by the companies. If the new medical apostles of the College of Health desired to effect any real good in this matter, they would examine the waters as they leave the mains of the companies, and as they are kept in the houses of their districts, and continue such examination over a long period. At present we have nothing to show that the results of the published analyses represent the average quality of the waters delivered, nor are we able to show whether the impurities said to exist are to be attributed to the defective arrangements of the companies, or to the carelessness of the inhabitants. It is sadly to be feared that the nomination of the new medical officers will expose the metropolis to an overwhelming flood of quackery; and earnestly do we entreat the various district boards to pause ere they commit themselves to any course suggested by the writers of "able reports," such as have hitherto come under our notice. In the meantime we wish the schoolmaster, who has been said to have been abroad so long, would return, to correct the style of our public documents.

COMMERCIAL VALUE OF GAS REFUSE.

Nothing, perhaps, is more remarkable in the history of gas lighting than the amazingly small advantage which this art has hitherto derived from the resources of practical chemistry. In the application of mechanics, aad in the expositions of science, there have been, indeed, no lack of inventors and instructors; but, nevertheless, if we look anywhere in our gas establishments for the methodical employment of that routine of operations by which, in the chemical arts, a profit is drawn from mere waste refuse, we shall look in vain. In this respect, matters remain as they were in the earlier eras of Murdoch, Watt, Clegg, and Lowe; then, as now, the only saleable products from a gas-work consisted of coke, gas, tar, and liquor.

We will not enter into an analysis of the circumstances which may have retarded the development of this particular industry, though, no doubt, much of it has been due to the benumbing agency of what are called "patents," but which ought in reality to be called "pretensions." It is enough, however, that at the present moment there is nothing either of the one or the other kind which stands in the way of a gas company sincerely desirous of carrying the manufacture of gas out to that economical point at which the greatest amount of profit is obtained at the least cost.

To give some idea of the erroneous nature of the present system, we will contrast together the money value of the articles now sold by the gas companies of the Metropolis, and those into which, by the application of practical chemistry, they may be converted: thus our readers will be able to judge for themselves how far improvement is yet likely to redeem the existing depression in this important interest. The amount of coals distilled for the supply of London with gas may be taken in, round numbers, at 600,000 tons per annum, which yield, on an average per ton, one chaldron of coke, 9000 cubic feet of gas, 10 gallons of tar, and 10 gallons ammoniacal liquor, making in the aggregate 600,000 chaldrons of coke, 5,400,000,000 cubic feet of gas, 6,000,000 gallons of tar, and the same quantity of ammoniacal liquor. Of these, the coke and gas are the only articles now sold in what may be regarded as a fully manufactured condition, the remaining ones being disposed of in a crude form, and necessarily at a price much inferior to their true value. But this is not all, since it happens that the impure gas, as it issues from the condenser, contains two substances, which require to be removed from it at a considerable cost, and which are now almost entirely thrown away, though, as we shall soon show, possessed of much value: one of these is ammonia, and the other sulphuretted hydrogen. The quantity of ammonia in the gas is fully twice as much as that usually contained in the ammoniacal liquor, and the sulphuretted hydrogen is about ½ per cent. or 1 in 200 volumes of the impure gas. Consequently we may regard the total impurity of the gas of London, as containing ammonia, equal to 12,000,000 gallons of ammoniacal liquor, and sulphur equal to 27,000,000 cubic feet of sulphuretted hydrogen gas, neither of which are now turned to account of profit.

On an average of the last few years, the price of tar has not exceeded ¾d. per gallon, and the price of ammoniacal liquor has been about 2s. 6d. per butt of 108 gallons; therefore, the actual selling price of the whole of the tar and ammoniacal liquor in the metropolitan gas-works may be taken at, per annum, as follows:—

6,000,000 gallons of tar, at ¾d. per gallon	£18,750
6,000,000 gallons of ammoniacal liquor, at 2s. 6d. per butt	6,944
	£25,694
From which we must deduct the cost of purifying the gas, at 6d. per ton of coals distilled	15,000
Total	£10,694

If, now, we examine the worth of these and the other impurities of the gas when made up into marketable products, we shall see an increase of value so astounding as to demand no ordinary share of faith in our correctness; yet the details

we are about to offer are all within the sphere of demonstration, and too small rather than too large. Let us suppose that in the purification of the gas we have employed the expired patented process of Mr. Croll, for removing sulphuretted hydrogen by means of the oxide of iron. By this process, the sulphur of the impure gas is gradually accumulated in the oxide of iron until this can be used for the production of sulphuric acid, which is quite practicable when no sawdust, or other organic matter, has been mixed with it. In this case, at a moderate computation, we may estimate the amount of oil of vitriol capable of being produced by the sulphur of the entire metropolitan gas-works, at not less than 3000 tons per annum, which would, if properly applied, as nearly as possible neutralise the whole of the ammonia contained in the impure gas, and yield 4000 tons of sulphate of ammonia, worth £16 per ton.

Meanwhile, the 6,000,000 gallons of ammoniacal liquor would produce, on the addition of 1500 tons of oil of vitriol, at, say, £9 per ton; 2000 tons of sulphate of ammonia, worth, as before, £16 per ton, making for sulphate of ammonia £96,000, with a drawback for oil of vitriol of £13,500.

And now we have to consider the 6,000,000 gallons of tar, which, being distilled and properly treated, as has been previously explained in our pages, would produce at least 1,500,000 gallons of paraffine or lubricating oil, and at least 150,000 tons of excellent fuel or coke. If, then, we estimate the coke at no more than equivalent to the distillation of the tar, and omitting all notice of naphtha, assume a profit of but 2s. per gallon upon the oil obtained, we shall have a list as follows:—

Sulphate of ammonia, derived from sulphur and ammonia of gas	4000 tons =	£64,000
Sulphate of ammonia from gas liquor minus £13,500 for oil of vitrol	2000 tons =	18,500
Purified oil, at a profit of 2s. per gallon upon 1,500,000 gallons	„ „	150,000
		£232,500

or nearly 22 times the previous income.

If, then, we admit a large outlay for labour, wear and tear, investment of capital, &c., there is, nevertheless, an obvious and certain source of profit, sufficient to make a perceptible difference in the dividend of our metropolitan companies, and fully justify us in the assertion, that practical chemistry has not yet fulfilled its task towards this important branch of industry.

ON SOME RECENT ARTESIAN BORINGS.

In our number for Feb. 5 of the current year, we proposed to return to a consideration of the recent operations of the Hampstead Water-Works' Company at the foot of Highgate Hill, if the published notice by Mr. Prestwich should warrant our doing so. Subsequently, the account by that gentleman of the proceedings of Messrs. Degoussée and Laurent has appeared in the February number of the "Quarterly Journal of the Geological Society;" and it was accompanied by the publication of a delayed communication from Mr. Godwin Austin, which our own independent observations enable us so far to confirm, that we feel it important to revert to the consideration of the subject. In the number of the "*Comptes Rendues de l'Académie des Sciences*" for the 18th Février, 1856, there is also inserted a notice upon the progress of the Artesian well in course of execution for the city of Paris in the plain of Passy, to which it may be advisable at the same time to direct attention. We may add, that we propose to insert in our JOURNAL, from time to time, notices or translations of foreign works connected with the subjects usually discussed in our pages.

Mr. Prestwich's account of the boring at Highgate Hill is substantially the same as that we before gave, excepting that he enters into very circumstantial details with respect to the number, the nature, and the thickness of the strata traversed. It appears that the thickness of the yellow brick earth (in which formation, by the way, many very interesting fossil remains have recently been found in other parts of the London basin, of a nature to induce the belief that it is a comparatively recent deposit) was about 30 feet 6 inches. The stiff blue London clay was found to be 205 feet 6 inches thick; the Woolwich series of the basement beds, 61 feet 6 inches; and the Thanet sands, 27 feet 6 inches: making the total thickness of the tertiary strata at this point, which is about 170 feet above Trinity Datum, 324 feet 6 inches. The boring was continued through the middle chalk (the upper division being wanting), of 244 feet 6 inches thick; the lower chalk, of 294 feet thick; and the chalk marl, 47 feet 6 inches thick: thus reaching the upper green sand at a distance of 910 feet 6 inches from the surface, and passing through a total thickness of the chalk of 586 feet. The upper green sands were found to be 72 feet 6 inches thick, and the gault 130 feet 6 inches: making, at the point where the normal geological conditions ceased, about 1113 feet 6 inches from the surface. Below this point the boring was carried to a further depth of 188 feet 6 inches, making the gross total from the surface 1302: traversing in this latter portion a series of beds of very irregular thicknesses of sands, clays, conglomerates, &c., of a nature to overthrow the usual reasoning upon the succession of strata under the chalk. Mineralogically, there seems to be little reason to doubt but that these beds belong to the new red sandstone series; but, from the occurrence of fossils and a few other minute geological indications, Mr. Prestwich seems still to believe it possible that they may be only a peculiar form of the lower green sands. He is, however, evidently much perplexed to assign their precise nature or geological position; whilst Mr. Godwin Austin, with more confidence, considers that he can recognise in them the *tourtia* belonging to the northern slope of the old Palæozoic axis of the Artois.

In the paper previously read by Mr. Austin at the Geological Society, he very ably stated his reason for believing that the great geological axis, beginning at the Hündsucke, passing through the Eifel, the Ardennes, the Artois, and the Boulonnais, was prolonged under the cretaceous and the weald deposits of the south-east of England, and reappeared on the surface in Somersetshire. He concluded that the tertiary formations of the Thames Valley corresponded with the geological conditions of the district beginning near Valenciennes and Douai, and continued through Bethune, Therouanne, and Calais; and, as it is known that coal measures have been reached in protions of this district, he arrived at the conclusion to which our own observations had previously led us, though we were not aware of the publication of Mr. Austin's paper, that the coal measures would also, in all probability, be found under the more recent English formations. Mr. Austin looked upon the conglomerate described by Mr. Prestwich, as occurring under the gault, as representing the *tourtia* of the Belgian coal measures; and he considered that its presence at Highgate proves the continuance of the physical line to which allusion has been made. The reasoning in this very able paper appears to us satisfactorily to prove the probability of the existence of coal under the metropolis, at a depth from the surface but little greater than that already attained by some of the coal-mines in the north of England. Who will expose himself to the certain outlay, the very uncertain success of the operations necessary to solve a question of such great scientific and commercial importance? If the experiment were made, it would, we suspect, be most advisable to try it towards the south of the metropolis; for the physical line Mr. Austin, and we ourselves, believe to exist, passes at some distance to the south of London. The words Mr. Austin uses to express his opinions on this subject are so strong, that we quote them as he gave them:—"We have strong *à priori* reasons for supposing that the course of a band of coal measures corresponds with, and may some day be reached along the line of, the valley of the Thames." What a change this theory, if proved to be correct, would make in the Pool!

The Artesian well lately undertaken at Passy was designed to meet the requirements of the ornamental waters and the fountains of the Bois de Boulogne; for, as the Emperor had decreed that rivers and lakes should be formed in the midst of a sandy plain situated at some considerable height above the River Seine, it became necessary to secure a copious artificial supply. In England we should have resorted to the very unpoetical mode of pumping the water from the river; but our neighbours have a fancy for extraordinary works, and they have therefore made a contract with a Saxon engineer, M. Kind, by which he is to execute for them, within twelve months from the date of his contract (July 18, 1855), a well able to procure a supply from the lower green sands which are known to exist under Paris. The upper part of the well is to have a wood steining, and the boring is to be two feet in clear diameter of the pipes, carried down at least 82 feet into the lower green sand, which is supposed to exist at a depth from the surface of about 1805 feet. An ascentional tube of 75 feet 6 inches in height is to be fixed on the top of this well, so as to force the water to the level required for the various

ERRATUM.

At page 182, 25th line, first column, *for* "150,000 tons of excellent fuel or coke," *read* "15,000 tons," &c.

works. The price agreed to be paid for this well was £14,000 (or 350,000 francs).

It may here be mentioned that the surface of the ground at the abattoir of Grenelle, where M. Mulot executed the very successful boring which brought this class of operation into so much notice, is situated at about 101 feet 8 inches above the mean level of the sea at Havre, and that the water-bearing stratum was found at about 1802 feet from the surface, rising by means of the ascentional tubes to 122 feet above the latter level, or 223 feet above the level of the sea. At the new well at Passy the surface of the ground is about 175 feet 4 inches above the level of the sea, and it is proposed to cause the water to ascend to about 250 feet 10 inches above that level, or 27 feet higher than at Grenelle.

The position for sinking the new Artesian well was fixed in one of the old quarries of Passy, at the corner of La Rue du Petit Parc and the Avenue de St. Cloud. The erection of the work-shops, steam-engine, and machinery, and the sinking of an upper well to a depth of about 37 feet 3 inches, were immediately commenced, and completed by the 20th of August, after which the boring tools were set to work; but it was not until the 15th of September that the men were sufficiently trained to their use to allow of the commencement of regular operations. In order to admit the wooden steining, the boring was executed of about 3 feet 7¼ inches internal diameter.

The boring or cutting tool is a species of trepan, weighing about 1 ton 16 cwt., bearing seven teeth of cast steel, each about 10 inches in length. The trepan, which works in water, is attached to a latch, by means of which it can be detached from the suspension-rod. This latch, or rather the whole of the falling tackle, consists of a species of cap, of gutta percha, 2 feet in diameter, bearing the head of a clip supporting the rod of the trepan. As the whole of this apparatus descends rapidly by its own weight, the gutta-percha cap, which is able to move about the axis of the falling tackle by means of two slides, is raised by the pressure of the water, and opens the clips supporting the trepan: when the instrument, on the contrary, ascends, the moveable cap, being exposed to an effort in an opposite direction, closes the clips. The trepan, thus falling about 2 feet every blow, may be supported by wooden rods about 4 inches thick, and in lengths of 33 feet each, screwed together at the ends; thus diminishing, to a great extent, the weight of the tools employed, and rendering (as is supposed) the operation more expeditious and economical. Movement is given to the instrument, composed of the rods sustaining the cap and the trepan, from the end of a beam worked by the piston of an engine, to which the steam is admitted from above, in the manner of the ordinary Cornish pumping-engine; the down stroke being effected by the weight of the rods themselves. A second steam engine, of 15 horses' power, sets in motion a crab, over which passes a cable, passing through a pulley fixed to a scaffold placed above the well, at a height of about 100 feet above the platform where well-borers are at work. After the trepan has sunk the hole a depth of about 5 feet, the rods are withdrawn, and the trepan is lowered upon a carriage running upon a railway; the shell, brought upon a similar carriage, is then placed under the pulley and lowered, for the purpose of extracting the materials thus detached. The shell is of wrought iron, with a moveable bottom; it is about 3 feet 4 inches high, and 2 feet 8 inches clear internal diameter, and is lowered and raised in a similar manner to the rods.

The two engines, of 15 horses' power each, are supplied with steam from the same boiler, working under a pressure of six atmospheres, or 90 lbs. on the square inch. The workmen employed are only six in number: a foreman of the well-borers, an engineer, a stoker, and three smiths for the repairs: their wages, at Paris, amount to about £2 per day. Up to the 1st of February, 1856, the cost of the engines, machinery, tubes, &c., had amounted to the sum of 93,865 francs, or £3763. 8s.; the repairs had cost £353; and the consumption of coals had been at the rate of half a ton per 24 hours, or had cost per day, at Paris prices, 16s. 11⅞d.—say 17s.

The upper well passed through a layer of vegetable soil and of marl, mixed with limestone and sand, of a depth of about 13 feet; and then was carried to a depth of about 23 feet into the *calcaire grossier* of the ancient quarries of Passy. The boring in this stratum, of a total thickness of 48 feet, did not present any difficulty; but, after passing through it, the well passed a bed of sand, mingled with shells, of 8 inches thick, and then a bed of sand 21 feet 7 inches thick. Great difficulties were experienced in passing through this stratum; and, after the sand had run in on several occasions, it was found necessary to line the bore with plate-iron tubes of 3 feet 8 inches diameter, and No. 7 gauge of our standard, as nearly as these dimensions can be translated. Similar difficulties were encountered in passing through the clays which uphold the waters in the existing wells of Passy and continue to the chalk, so that it was found necessary to tube through them. There was great difficulty in driving the tubes; and the operation was finally performed by weighting them with about 22 tons, and boring under them by means of loose ears fixed on the trepan. In this manner the tubes were lowered, until they were firmly fixed in the upper chalk, about the 26th of October, at a depth of about 155 feet 3 inches from the surface.

From this period the descent has taken place without interruption, although the flint nodules, hitherto found in abundance, have materially retarded the rate of advance. In the pure chalk, the trepan will easily descend 16 feet 5 inches per day; whereas, in the case where it meets with numerous flint nodules, the rate of descent will not exceed 1 foot 4 inches in the same period. At times the points of the trepan will wear away about four-fifths of an inch in two hours' work; and it becomes necessary to sharpen them every time they are drawn, in order to keep the bore perfectly vertical and cylindrical. In consequence of these difficulties, the progress of the work had been considerably delayed; and at the 1st of February, after 4½ months' incessant labour, the boring had only reached a depth of 888 feet 10 inches from the surface.

Upon the subject of this mode of boring, it may be observed that it appears to have been suggested partially by the system of M. Fauriel, which Dr. Buckland and M. Arago attempted to introduce some years since, improved simply by the application of steam power. The rate of descent has, however, been very remarkable; and, notwithstanding the somewhat disparaging terms in which the notice has been written, our experience in these matters induces us to consider that it is a very satisfactory result to have reached the depth of 888 feet in 4½ months. But, although the nature of the lower chalk (the chalk without flints of the geologists) induces us to believe that the boring may advance more rapidly in it than it did in the upper members of the same series; and, therefore, there may be reason to believe that the rate of descent hereafter may be increased rather than diminished; yet it must be borne in mind, that hitherto no untoward accident with the boring tools has occurred. In sinking the well at Grenelle, a shell, with about 260 feet of rod, fell to the bottom on one occasion, and it required about 15 months of unremitting labour to obviate the effects of so momentary an accident; again, whilst operating upon the gault, another tool became detached from the rods, and it became necessary to thrust it aside. Should any such accident occur at Passy, M. Kind's engagement to complete the works within a certain period must either be worthless, or else it will involve him in utter ruin. The system of detaching the cutting tool at every stroke, and thus avoiding the jar upon the upper lengths of the rod, must be considered to diminish this danger to some extent, because the rods, not being thus exposed to repeated concussions affecting them both by the vertical and the horizontal vibrations, are not so likely to become changed in their molecular structure as they would be if they were directly connected with the cutting tool. We are aware that railway engineers differ greatly in opinion with respect to the change superinduced by frequent blows in the molecular structure of iron bars; but, without entering into an examination of the arguments advanced upon the phases of the question likely to interest them, we would observe, that experience shows that long wrought-iron rods, exposed to frequently renewed vertical concussions, lose their fibrous character, and assume a crystalline one, and become brittle. But, in well-boring, the danger consists quite as much in the rod's slipping through the crow's feet which support the lower lengths whilst the upper ones are being unscrewed, as in the breaking of the rods themselves. M. Kind's system of unscrewing in 100 feet lengths diminishes this danger; but it cannot, even thus, be entirely removed; and he is exposed to see his operations indefinitely retarded by the carelessness of a workman as much as his predecessors were. Nevertheless, we are convinced that the system of striking with a tool falling freely, and always with a certain force, must be regarded as a marked improvement upon deep Artesian well-sinking.

The engineers who prepared the project for this well have, we fear, fallen into an error with respect to its probable yield, so far as the height to which it may be delivered is concerned. M. Walferdin ascertained that the point upon the banks of the Seine, where the lower green sand outcrops, is about 212 feet above the surface of the ground at Grenelle, and 138 feet above the same level at Passy. It remains to be proved whether the small effectual head of 75 feet 6 inches will be sufficient to overcome the friction of the water in passing from the neighbourhood of Lusigny to Paris, and in rising through the ascending main. We are inclined to doubt that this will be the case; and, indeed, it appears to us more likely that the new Artesian well should diminish both the quantity and the altitude of the supply at Grenelle, than that it should secure an equally copious supply at a higher level than that to which the water rises in the latter establishment.

ON THE POSITION OF SCIENTIFIC MEN IN ENGLISH SOCIETY.

Mr. Heywood has given notice of motion in the House of Commons for a committee to inquire into the public measures which may be taken to advance the diffusion of science, and to improve the position of scientific men in our country. The parliamentary committee of the British Association for the Advancement of Science have also issued a long report upon the question, "Whether any measures could be adopted by Government or Parliament that would improve the position of science, or (of) its cultivators, in this country?" whilst the Committee for the Reorganisation of the Civil Service is pursuing its course of examination and rejection of candidates for official positions, with reference, we are led to believe, solely to the degree of education, of literary and scientific acquirements, on the parts of those candidates. What would be the effect of any measures of this description, such as are likely to emanate from a committee chosen, as most of the parliamentary committees are, from men who enter upon the investigation of the subject referred to them with a foregone conclusion? What measures is it advisable to adopt in order to secure the objects assumed to be so desirable? or, after all, is there any necessity for action of any kind in the matter, so far as the diffusion of science is concerned? or is the system in course of essay by our Government, to secure to itself servants of average ability, one which is likely to produce satisfactory results? These questions appear to require serious consideration.

For our own parts, we hold that any thing like direct State intervention in the cultivation of science will infallibly injure the cause it is desired to advance. The essential condition of successful scientific research is, that its authors should be free and unbiassed, both as to the nature, direction, and scope of their investigations, and as to the time and manner of presenting them them to the world. But, if the State should undertake to advance science, the direction it is to follow must necessarily depend upon the appreciation those who may be at the head of the Government at the time may form of the wants of the society it is supposed to guide. Freedom of action is thus at once destroyed; and, although the real wants of society will, sooner or later, force upon the attention of scientific men the consideration of the subjects most necessary for its good; yet, in the mean time, much mischief may be done—many a valuable opportunity let slip—which would not have been the case had men been left to the uncontrolled exercise of their faculties. The very position of the governmental authorities removes them from instant and direct contact with the classes for whom, and amongst whom, the intellectual development of an age must be worked out; and it must always be a dangerous and equivocal course to place the minds of a nation in the leading-strings of any body of men, however learned, able, or conscientious they may be. If it be desired to strengthen "the principle of authority" so much talked of lately, it may, perhaps, we wise to take under the control of the state the mode of diffusing science, as forming, in fact, part and parcel of the system of state instruction; but, if it be desired to advance the true interests of humanity, it appears to us, at least, certain that the wisest course is to leave society at perfect freedom to cultivate or neglect what a certain class of men agree to call Science, as it may find to be most advisable. There is, in fact, a strange instinct in all large bodies of men which leads them to study with the most energy—and, therefore, with the most profit—the things they immediately require; and they who have observed the various stages of intellectual development know that, whenever society is ripe for a grand discovery, it is made generally by more than one independent observer. Almost all the discoveries, too, it must be observed, which have changed or deeply modified the conditions of society, have originated amongst those who have been out of the ranks of what are called scientific men; and it is precisely in the countries where the State does the least, that the most of these extraordinary discoveries have arisen. The fact is, that no state can attempt to guide or protect science, unless it has in its employ a sufficient staff of scientific advisers, who, for the most part, have (hitherto) been educated in regularly organised academies. Such men, so educated, invariably become pedants; and what has been aptly called the tyranny of schools becomes substituted for the temporary disadvantages—if disadvantages there be—arising from the unrecognised position of the cultivators of abstract science.

When the question as to the position scientific men ought to hold in society is impartially examined, there can be little reason to doubt but that the conclusion must be arrived at, that it will eventually depend upon the characters of those men themselves. Consideration and respect are only accorded sincerely and permanently, in free and enlightened communities, to those who merit such distinction; and it is to be hoped that the advocates of the claims of science seek only to attain that end. Such men as Herschel, Davy, Farraday, Woollaston, Young, Watt, Telford, Stephenson, and their colleagues in merit, have always enjoyed as much real consideration in our country as they would have done had they been styled Royal Professors, or Government Engineers, or had they been entitled to wear embroidered coats, enamelled stars, or the other foppery in which courtiers delight. To say that men do not rise here to social eminence and political power, on account of their scientific reputation, as Cuvier, Laplace, Humboldt, De Barante, Guizot, Dumas, D'Azeglio, Martinez della Rosa, and others, have risen in foreign countries, proves nothing, either in favour of the system admitted on the Continent, or against the one we follow. Certainly the men we have named were, and are, as illustrious as any on the rolls of Fame; and yet their conduct in power seems to prove that the professorial, analytical spirit of men deeply versed in science is totally unfitted to the management or control of the great synthesis of national life. As Napoleon said of Laplace, such men carry the method of infinitesimals into everything; and, beyond the shadow of doubt, the ruin of the constitutional Government of France may principally be attributed to the pedantic obstinacy of that eminent professor of history, M. Guizot. In England, however, it may be idle to discuss this precise branch of the question, because we are essentially an aristocratic people; and nobody can take rank in the governing class without he belongs to or forces his way into that body, which, it may be said in passing, has always shown itself anxious to absorb and assimilate to itself the men endowed with talents likely to be of service to the State. Practically, this tacit arrangement has been found to work well; the arrangement by which purely scientific men have been thrust into political situations has produced results as mischievous as our own has produced satisfactory ones. May it be long, therefore, before we cast aside the system we have ascertained to be good, in order to prove another known to be fatally dangerous; and sincerely do we hope that our scientific men will not allow themselves to be turned aside from the pursuits, or to abandon the principles of self reliance and love of science for its own sake, instead of the prizes it might offer, which have enabled them to attain the high and essentially useful position they now hold!

It is often said that at the present day it is necessary to adopt energetic measures "to extend effectually the knowledge of scientific truths," in order to enable our manufacturers to maintain their ground in the race of competition with those of other states. There may be danger in "optimism," and in shutting our eyes to the progress of our rivals; and therefore we ourselves are anxious to avoid lulling our manufacturers into any false security on the subject. But we assert boldly that, both in the Exposition of 1851 in Hyde Park, and of 1855 in Paris, Englishmen retained their supremacy in all the arts and manufactures for which local circumstances had given them a peculiar vocation. There are secret, but all-powerful, influences connected with climate, social organisation, or even forms of religious belief, able to determine men in the choice and cultivation of the profession by which they live. Race, too, has, it may be suspected, something to do with the singu-

larly mysterious and complicated phenomenon of a national mind; and, though the country of the arts may be said figuratively to have shifted from Greece to Florence, and from Florence to Paris, Munich, or Dusseldorf, yet in all its migrations it will be found that the cultivation of the fine arts has prospered the most when the southern element has prevailed; whilst the sterner and more practical pursuits have been attended to by the more independent, self-relying, and dispassionate inhabitants of the north. However this may be, it is certain that we, as a nation, have never been remarkable for the elegance or refinement of our taste in painting, sculpture, architecture, or music. On the other hand, we have always distinguished ourselves by the execution of works of utility, by our practical applied science, and by our indomitable perseverance and energy. "*On a toujours les défauts de ses qualités*," says the French proverb. Our quality of perseverance may hardly coexist with the feverish impatience of genius for the fine arts; but would it be desirable to sacrifice the one in the chase of the other? Would not the measures it is proposed to make us adopt to some extent render this result possible? But, apart from this consideration, we are convinced that the hardwares, the cutlery, the iron-work, the cotton, linen, and woollen fabrics of the United Kingdom maintained their wonted supremacy over the those of other countries. We may not boast of porcelain works equal to those of Sèvres; but no French makers can compete with our Staffordshire potters. We may not damascene a sword or model a bronze figure so well as those marvellous Parisian artists are able to do; but we can make knives, and razors, and files, that can cut and wear well. We cannot boast of carpets like the Gobelins, the Beauvais, or the D'Aubuisson looms produce; but we make strong, useful, and not inelegant carpets, at prices which allow of their use in cottages; whereas the former are only to be seen in king's palaces. Our cottons and silks do not rival in elegance of design the fabrics of Mulhouse, Switzerland, or of Lyons; but they are stronger and cheaper. So it is throughout. We lack taste; but we aim at practical utility: and, were it not that attempts have been made to introduce amongst us foreign organisations and foreign opinions on social questions, we should equally retain our moral superiority.

We have been indebted for the high position we have thus maintained principally to the unshackled exercise of our native energies, and to our undirected talents. Having no false theory to bind the nation, we have advanced in the direction most likely to enable us to reach the goal we have had in view. When a want has been felt, it has been supplied in the manner and by the means most practically adapted to the end; and when we turn to the examination of any detail of civilisation, the contrast between the results attained here and in the countries under paternal governments, where art and science are favoured and protected, we must be convinced that, with all our shortcomings—and many and serious they are—the "*laisser passer, laisser faire*," system is the wisest and most successful in the end.

Something might be done in the direction indicated by Mr. Tite—himself a good illustration of the consideration to which a scientific man may attain by the exercise of unaided talent and energy. It would certainly tend to diffuse science were schools established in some of the great centres of activity, in which schools the knowledge there more especially required could be communicated—such as schools for navigation at Liverpool; for fine arts and constructive science at Birmingham, Manchester, Leeds, &c.; for agriculture, at York; for mining, in Cornwall. The scheme Mr. Tite proposed would not cost much; and its success would depend upon the energies of the professors appointed, and the appreciation by the public of the things taught: and these are, we hold, the only justifications for State intervention in such matters. Really sound professors in colleges or schools of this kind would always command as much respect and deference as they merited; and, if kept above want, they would be able, if they made their teaching acceptable, to improve their own pecuniary position, as well as to diffuse the knowledge so eagerly sought for by our labouring populations. Anything else would end in disappointment and failure: for, after all, the best education which men or nations can receive is the one they can give themselves; and it is in vain to hope to improve the social position of scientific men, if they be not themselves able to secure, and worthy to retain, the respect and consideration of those with whom they associate. We have great doubts whether even the very little we recommend to be done in these matters be not more than would be justifiable by the strict principles of political economy: more than this would expose England to the danger of losing its peculiar national character, without securing the qualities Nature seems to have denied us.

It is a curious commentary upon the results of State protection of arts or sciences, that wherever academies have been formed for the encouragement of art, there art has immediately declined. The *Cinque-cento* artists of Italy flourished before the various state schools or academies were founded; and whom have the latter produced to walk with the giants of early times? Such men as Le Brun, Le Sueur, Claude, Poussin, and Vouet, lived before the *Académie des Beaux Arts* was established in France; and certainly that country has not produced successors worthy of being placed in the same rank with those men. Reynolds, Gainsborough, Barry, Hogarth, flourished here before Royal Academies existed; and, alas! their places have never been adequately filled. Nearly similar results may be observed in the state institutions of the continent, with respect to improvements in engineering science; for it has been truly observed that road-making, harbours, light-houses, canals, suspension bridges, mining, steam-engines, steam-boats, railroads, gas lighting, and the electrical telegraph, were all either of British invention, or owed their useful application or their improvement to British industry; whilst not one of the modern inventions for annihilating time and space, or to advance the happiness of our race, can be said to have originated from the scientific bodies organised under State protection. Let these trees be judged by their fruits! Sure we are, that he who runs might read, if he liked, that society can advance and defend itself far more efficaciously than any government can do; and that the best way to improve the position of science and of its cultivators would be to leave them alone—to let them make their own positions.

We regret to be obliged to say that the proceedings of the majority of the parliamentary committees, of late years, have been such as to induce us to dread the effect of referring a question to any such tribunal. A member mounts a hobby, as Tristram Shandy would say; he asks for a committe; and, if a great bore, or a Cabinet Minister, or other individual it is thought worth while to propitiate, he obtains a committee of his own nomination, and over which he himself presides, with a casting vote. The Public Health Committee of last year, the National Gallery Committee, the Food Adulteration Committee, &c. &c., may be referred to as illustrating the working of this ridiculously unfair system, which Mr. Lowe is about to set in motion, by the way, in the "passing tolls" question. What good can result from submitting the vital interests of the country to such a tribunal, or what chance is there that truth will be heard, or even, if heard, of its being recorded? for it is to be observed that the present Government have perfected the system of suppressing evidence to such an extent as to render even the reports of the parliamentary committees comparatively valueless as records.

Evidently the Council of the Institute of British Architects has felt the same difficulty we have done in this matter, and by its rejection of any proposition for the establishment of a diploma, it has proved that the "snobism" of the day cannot blind it to the dangers of establishing the worst of all possible hierarchies, that of education. Most cordially do we approve their decision; and most earnestly do we hope that the Legislature will also pause in its career towards the establishment of a new and insolent aristocracy. There was, we admit, much jobbery in the old system of appointments to Government offices. The remedy is to abolish such useless offices altogether, not to examine candidates in their grammar and prosody, sadly neglected though those branches of education now are by the heads of departments. We want few Government officers, and that *they* should be honest men. What guarantee for the latter condition is afforded by the examination of the candidates in their "humanities?" The worst of the matter is, that whilst the examiners are over severe on the poor candidates for places of £100 or £120 a year, and turn back many because of their bad style of composititon, such men as Sir B. Hall can write, without calling forth a storm of public ridicule, a letter so vilely composed as the one he lately sent to the Metropolitan Board of Works: and it is impossible to discover a Government bill which does not literally swarm with mistakes in grammar from one end to the other. La Baumelle said trully, "*en générale on exige trop de talents pour les petits emplois, et on en exige trop peu pour les grands.*" It would

be but fair to make our Ministers go through an examination, if the fashionable theories be correct. For our own parts, as slang words are also the fashion, we regard the nonsense which is talked about the advancement of science and competitive examinations as "*humbug*." Science can defend itself, and needs no aid, thank God! In public affairs we want honest, rather than learned, men; and the result of holding forth the tempting baits of place and power to a precocious development of the intellect, will, it is to be feared, end rather in the creation of a numerous and dangerous class of disappointed candidates, than in the securing the services of the right man in the right place. Devoutly do we hope that the Legislature will leave science to take care of itself, and that it will cast aside all notions of advancing its position or that of its followers.

Circular to Gas Companies.

In consequence of the improved prospects of many of the gas-works' companies throughout the country, and of the increase which has recently taken place in the value of their property, it appears probable that such of them as are under the operations of the Gas-Works' Clauses Act may soon be called upon to consider the operation of the 30th and following clauses of that act, upon the future management of their undertakings. The troubles which are contingent upon the distribution of profits above 10 per cent. upon the capital do not exite much sympathy, and, indeed, are willingly incurred; but, joking apart, there are considerations attached to the questions suggested by the above-named clauses which merit the serious attention even of the companies which are not in this enviable state of perplexity.

The clauses so named are as follows:—

XXX. The profits of the undertaking to be divided amongst the undertakers in any year shall not exceed the prescribed rate, or where no rate is prescribed, they shall not exceed the rate of £10 in the £100 by the year on the *paid-up capital in the undertaking*, which in such case shall be deemed the prescribed rate, unless a larger dividend be at any time necessary to make up the deficiency of any previous dividend which shall have fallen short of the said yearly rate.

XXXI. If the clear profits of the undertaking in any year amount to a larger sum than is sufficient, after making up the deficiency in the dividends of any previous year, as aforesaid, to make a dividend at the prescribed rate, the excess beyond the sum necessary for such purpose shall from time to time be invested in Government or other securities; and the dividends and interest arising from such securities shall also be invested in the same or like securities, in order that the same may accumulate at compound interest, until the fund so formed amounts to the prescribed sum; or if no sum be prescribed, a sum *equal to one-tenth of the nominal capital of the undertaking*, which sum shall form a reserved fund to answer any deficiency which may at any time happen in the amount of divisible profits, or to meet any extraordinary claim or demand which may at any time arise against the undertakers; and if such fund be at any time reduced, it may thereafter be again restored to the said sum, and so from time to time, as often as such reduction shall happen.

XXXII. Provided always, that no sum of money shall be taken from the said fund for the purpose of meeting any extraordinary claim, unless it be first certified, in England or Ireland by two justices, and in Scotland by the sheriff, that the sum so proposed to be taken is required for the purpose of meeting any extraordinary claim within the meaning of this or the special act.

XXXIII. When such fund shall, by accumulation or otherwise, amount to the prescribed sum, or *one-tenth of the nominal capital of the company*, as the case may be, the interest and dividends thereon shall no longer be invested, but shall be applied to any of the general purposes of the undertaking to which the profits thereof are applicable.

XXXIV. If in any year the profits of the undertaking divisible amongst the undertakers shall not amount to the prescribed rate, such a sum may be taken from the reserved fund as, with the actual divisible profits of such year, will enable the undertakers to make a dividend of the amount aforesaid, and so from time to time, as often as the occasion shall require.

XXXV. In England or Ireland, the Court of Quarter Sessions, and in Scotland the sheriff, may, on the petition of any two gas ratepayers within the limits of the special act, nominate and appoint some accountant, or other competent person not being a proprietor of any gasworks, to examine and ascertain, at the expense of the undertakers (the amount of such expense to be determined by the said court or sheriff), the actual state and condition of the concerns of the undertakers, and to make report thereof to the said court at the then present or some following sessions, or to the sheriff; and the said court or sheriff may examine any witnesses upon oath touching the truth of the said accounts, and the matters therein referred to; and if it thereupon appear to the said court or sheriff that the profits of *the undertakers* for the preceding year have exceeded the prescribed rate, the undertakers shall, in case the whole of the said reserved fund has been and then remains invested as aforesaid, and in case dividends to the amount hereinbefore limited have been paid, make such a rateable reduction in the rate for gas to be furnished by them, as, in the judgment of the said court or sheriff, shall be proper, but so as such rates, when reduced, shall ensure to the undertakers (regard being had to the amount of profit before received) a profit as near as may be to the prescribed rate.

It is not often that recent acts of Parliament are drawn up in language which allows of their being understood, or which has much reference to the rules of English grammar. The Consolidation Acts are, perhaps, less exposed to criticism on this score than many others; but even they are very far indeed from presenting the clearness or the comprehensiveness we are entitled to expect in laws of such extraordinary importance. In clauses 30, 31, and 33 of the Gas-Works' Clauses Act quoted above, for instance, we have printed in italics three passages which contain this strange contradiction—that whereas in the first it is apparently only a question of the paid-up capital in the undertaking, in the second allusion is made to the nominal capital of the undertakers; and in the third it is again a question of the capital they had embarked in the undertaking. The meaning of the Legislature is easily enough understood, but it is not creditable to the officers charged with the final correction of the language used in acts of Parliament, that discrepancies which, in bad hands, might so effectually defeat the intentions of the Legislature, should be allowed to exist. Again, the repeated use of the term "*nominal capital*" of the companies, opens the door to proceedings able to render nugatory all the subsequent provisions with respect to the division of profits, or the reduction in the price of gas to the public, after such profits shall have been paid.

No body of directors which respects itself would, however, condescend to take advantage of such defects in the wording of an act of Parliament, or to imitate the pettifogging spirit in which the law officers of the Crown act in cases similar to that of the Dover Gas and Water Company, alluded to in our Journal of Aug. 10, 1855. It must be evident that the intention of the Legislature, in passing the Gas-Works' Clauses Act, was in future to equalise the dividend to be paid to the undertakers, and limit those dividends to a maximum of 10 per cent., giving the public the benefit of a reduction in price when the maximum had been attained, and the reserve fund had been carried to such an amount as to guarantee the security of the property. To carry this intention into effect, it becomes, therefore, extremely important that the accounts of the various companies should be kept in such wise as to allow of its being easily and clearly ascertained what are the actual state and conditions of the concern.

Considerable difference of opinion exists amongst auditors of gas accounts as to the principles upon which they should be made out. Some eminent authorities contend that every charge for new works, meters, and service-pipes, should go to capital; whilst others contend that a portion of these charges should be debited to the profit and loss account, as forming part of the expenses of carrying on the concern; and in the cases of some companies, a special account is opened for the meters and service-pipes. Evidently, if it were desired to increase the *nominal* capital of the undertaking, the first course would be the most advisable, especially as such capital would really be paid up; but, in order to ascertain "the real state and conditions of the concern," we believe that the proper mode of proceeding is to debit revenue with the original value of all apparatus, plant, and mains removed to make way for the introduction of larger or improved machinery; and with regard to the meters and service-pipes, in cases where no charge is made for their hire, to debit revenue with all expenses incurred on their account, after the expiration of (say) five years from the commencement of operations. When a charge is made for the use of meters, then the cost of repairs and of new meters should be set against the meter rents, without appearing in the profit and loss account of the company; but only in the balance-sheet as an asset. The system by which expenses incurred really for the purpose of obtaining an increase of revenue are charged to capital, appears to us to be a very dangerous, if indeed it may not be called an immoral, one; because it acts in such wise as to produce the impression that the profits of the concern are greater than they really are, and at the same time it tends to convey the impression that the property of the undertaking is far greater than it really is. Fairly and honestly, the capital of a company ought only to represent the actual structural value of the works, and the assets of the company. When the nominal capital is made to represent, not only what those works, &c., are worth, but also everything which has been spent upon their extension and improvement, the amount of such nominal capital ceases to represent a fact; and it serves only to mislead the undertakers and the public as to the real conditions of the concern.

So far as regards the diminution of the price of gas to the public, under the clauses of the act of 1847, above quoted, we do not think that the mode of keeping the accounts we recommend will seriously affect the question in any way; but it does appear to us of vital importance that the shareholders, in any concern, should be able, at all times, to form correct opinions

as to the real value of the property in which they are interested. In the matter of the meters and service-pipes, we are of opinion that the best course would be to keep a separate account of all charges and revenue connected with them, and to debit this account with the prescribed rate of dividend upon the capital employed in it, regarding only the balance (if any exist) as an available asset in the balance-sheet. The fact is, that meters are implements furnished for the use of the consumer, and ought to be at his charge quite as much as ordinary gas-fittings. Whatever cost they may entail ought to be covered by a special charge, and ought not to appear in the ordinary working accounts of the company.

Communicated Articles.

EXAMINATION OF THE PROCESS OF MAKING GAS FROM COAL AND FROM WATER.

PROPOSED BY M. GALY-CAZALET.

Report to the Committee of the Association of Industrial Artists and Inventors, by M. FAURE, *Civil Engineer.*

(*Continued from page* 157.)

It is known that the Imperial Commission experimented with ovens constructed at Sèvres by M. Pauton, in the best manner for the economical application of heat, and with all the improvements now introduced in furnaces and chimneys. The following is one of the results obtained and published by the Imperial Commission:—

100 kilogrammes of coal, at the price of		2·5000 frs.
55 kils. of coke, at 0·03 fr.	1·6500 frs.	
6·73 kils. of tar, at 0·05 fr.	0·3365	
7·31 kils. ammoniacal liquors, at 0·05 fr.	0·0365	
Saleable value of the products	2·0230 frs.	
Deduct loss in storing, 15 per cent.	0·3034	
		1·7196 frs.
Net cost of the production of gas for illumination, deduction being made for the coke consumed in heating the retorts (20·43 kils.)		0·7804
And for 1 cubic mètre		0·0340

The cost of production is valued in the statement of the companies in the following manner:—

100 kils. of coal, at the market price		3·000 frs.
40·25 kils. of coke, at 0·03 fr.	1·2075 frs.	
1·01 kil. of tar, at 0·05 fr.	0·0505	
8·76 kils. ammoniacal liquors, at 0·05 fr.	0·0438	
Saleable value of products	1·3018 frs.	
Deduct loss in storing, 15 per cent.	0·1953	
		1·1065 frs.
Net cost of the production of 22·940 cubic mètres of gas, deduction being made for the coke consumed (24·75 kils.)		1·8935
And for 1 cubic mètre		0·0789

The difference between the figures of the commission and those of the companies is certainly very considerable, since one amount is nearly double that of the other. A large portion of the difference is to be attributed, without doubt, to the improved apparatus at the works at Sèvres; but it seems to us proper to remark, in the first place, that the commission reckoned as receipts the whole of the tar produced, whilst, in fact, a large portion of the tar (3·19 kils., equal in saleable value to 0·1745 frs. per 24 cubic mètres, or 0·0073 fr. per cubic mètre) would be absorbed in the manufacture of the gas; and, secondly, that the market price of the coal, stated by the companies at 3 frs. per 100 kils.—a price which will certainly be rather exceeded than reduced for a long time to come—represents an increase of 0·0281 fr.: thus it would, perhaps, be right to add to the 0·0340 fr. estimated by the commission, the 0·0281 fr. arising from those two causes; and the net cost of production of 1 cubic mètre of gas would then be reckoned at 0·0621 fr., adopting, in other particulars, the results of the Imperial Commission.* We thus perceive that the economy due to the apparatus and to the mode of manufacture adopted at the gas-works at Sèvres, reduced the cost of the cubic mètre of gas to 0·0168 fr.: that is to say, this saving is equal to only 20 per cent., or about a quarter of one element, which of itself does not, according to the statement of the companies, represent more than 34 per cent. of the cost price of a cubic mètre of gas when it is delivered to the consumer. Taking the estimate of the other elements as given by the companies, we shall arrive at the following results:—

1. Cost of distillation, deduction being made for the products at the market price, according to the valuation of the Imperial Commission	0·0340 frs.
2. Waste of gas in the pipes, at 15 per cent.†	0·0051
3. Cost of manufacture, purification, repairs of the ovens and of the pipes, general expenses, and management	0·0854
4. Octroi on the gas entering Paris	0·0200
5. Tax on the pipes (200,000 frs.), applied to a consumption of 25,000,000 cubic mètres	0·0080
6. Interest on capital	0·0495
	0·1981 frs.

If, instead of the price of 25 frs. the ton of coal, the price of 30 frs., as indicated by the companies, be adopted, the cost of a cubic mètre of gas, as delivered for consumption, would be increased to ·2199 fr. Thus the price of the cubic mètre of gas delivered at the burner should be as follows, with the mode of manufacture at present adopted:—

According to the valuation of the companies (coal at 30 frs. per ton)	0·2309 frs.
According to the estimate of the Imperial Commission (coal at 30 frs. the ton)	0·2199
According to the estimate of the Imperial Commission (coal at 25 frs. the ton)	0·1981

If we observe, *en passant*, that the actual price at which gas is sold to consumers by the companies is 0·42 fr., we shall understand that there was cause for the solicitude of the Emperor respecting this branch of the public service. Let us add—1. That the annual consumption of illuminating gas amounts, in Paris alone, to 25,000,000 cubic mètres; and in all the places actually supplied with gas in France, to 100,000,000 cubic mètres at least. 2. That this consumption, which is daily increasing, would certainly be at the least doubled in a short time if the price of gas lighting should be considerably reduced. 3. That it might and would attain a prodigious development, the extent of which it is even impossible to foresee, if the price of the cubic mètre of gas delivered at the burner should be reduced so low that the actual cost price of 0·231 fr. might become a sufficiently remunerative selling price. Assuming these facts, we may conceive the importance of a mode of manufacture which would at least attain these results. We do not say they would be greater, in order to avoid all chance of deception.

Calculation of the Cost Price of Coal Gas made by the Galy-Cazalet Process.

The distillation of 1000 kils. of coal produces, as we have seen, 340 cubic mètres of gas, certainly more luminous than the gas obtained by the usual methods; 640 kils. of coke, after deducting the fuel burned during the operation; and 47 kils. of ammoniacal liquors.

1000 kils. of coal, at 25 frs.		25·00 frs.
Deduct 640 kils. of coke, at 0·03	19·20 frs.	
Waste in storing, 15 per cent.	2·88	
Selling value of the coke	16·320 frs.	
Ditto of the ammoniacal liquors (47 kils. at 0·005)	0·235	
		16·55 frs.
Cost of material consumed to produce 340 cubic mètres of illuminating gas		8·45 frs.
Cost for one mètre		0·024

Adding 0·001 fr. on account of the expense of the blast of air to the cupola, the cost price of the materials for making 1 cubic mètre of gas would be 0·025 fr.*

It affords a very incomplete statement of the favourable circumstances which pertain to the system for the production of gas invented by our colleague, if we limit our calculations of the cost price to the elementary materials. It is important to state, and to show you that the economy inherent in the system proposed by M. Galy is especially apparent in diminishing the charges of the other elements which enter into the cost price. We shall examine them separately.

1. *Labour in Working the Ovens.*

Two ovens, of five retorts each, produce about 1000 cubic mètres of gas in 24 hours, and are worked by two sets of workmen of two each, working alternately. The expense of this labour amounts to 0·014 fr. per cubic mètre delivered at the gasometer. Admitting that the time occupied in one operation on 1000 kils. of coal charged in a cupola to be about three hours and twenty minutes, which appears to us to be possible in regular working, the quantity of gas produced in 24 hours would be 8000 cubic mètres, employing four workmen. The expense per cubic mètre would be thus reduced to 0·0017 fr., or to 0·002 fr., instead of 0·014 fr., or a saving of 0·012 fr.

2. *Repairs of the Ovens.*

The ovens, consisting of five cast-iron retorts, the average duration of which is 290 days, produce, during that time, 290,000 cubic mètres of gas. They cost 5000 frs.; and, allowing the price of 4000 frs. for their renewal, the proportion for each cubic mètre would be 0·0136. The repairs of the two cupolas would not cost more than 5 frs. a day. The proportion of that amount to 8000 cubic mètres would be 0·0062, or a saving of 0·013 fr.

3. *General Expenses and Capital engaged in the Construction of Apparatus.*

An annual consumption of 25,000,000 cubic mètres delivered at the burners, which supposes a production of 30,000,000 delivered

* About 1s. 5½d. the 1000 cubic feet.

† The waste and loss of gas in the pipes are here reduced to 15 per cent., whilst the companies estimate them at from 25 to 30 per cent.

* About 7d. per 1000 cubic feet.

at the gasometer, would require the construction of 340 ovens of five retorts, or an outlay of capital equal to 1,700,000 frs. Twenty cupolas would amply suffice for the production of the same quantity; and, assuming one furnace to be in a state of renewal for every two in work, there would require to be constructed—

30 cupolas, with their accessories, at 8000 frs. each ..	240,000 frs.
Bellows, with the engines for working them	110,000
	350,000 frs.

The space occupied by the cupolas, and the buildings which enclose them, would be considerably less; and we shall be very moderate in reckoning under this head a saving of 250,000 frs. of capital. Thus the amount to be provided and sunk in the establishment would be reduced 1,600,000 frs., equivalent to an annuity of 104,000 frs., or 0·0042 fr. per cubic mètre. All these different savings added together amount to 0·0292 fr. on the cubic mètre of gas.

The cost price of the cubic mètre of gas delivered at the burner, and made by the process of distillation of coal invented by M. Galy, would then be as follows:—

Cost of distillation, deducting the value of the non-gaseous products	0·0250 frs.
Loss of gas in the pipes, at 15 per cent.....	0·0037
Cost of manufacture, purifying, repairs of the furnaces and pipes, 0·064 — (0·012 + 0·013)	0·0394
General expenses and cost of management	0·0171
Octroi on the gas entering Paris.....	0·0200
Tax on the pipes	0·0080
Interest on capital, 0·0495 — 0·0042	0·0453
Cost of the gas delivered at the burner.....	0·1585 frs.

If we take into consideration, 1st, the estimate of the gas companies, 0·2309; 2nd, that of the Imperial Commission for the elementary material (the other elements being reckoned according to the figures of the English company), viz., 0·1981; 3rd, the possible cost price by the Galy process, 0·1585; we shall perceive that the last amount presents a saving of 0·0714 frs., or 30 per cent., on the estimate of the gas companies, and 0·0396 frs., or 25 per cent., on that of the Imperial Commission. The mere statement of these very significative estimates, with the consideration which we hope will be realised, that the gas obtained by the Galy process would possess superior illuminating power to that of the gas generally supplied, makes it unnecessary for us to say more on this point.

Calculation of the Cost Price of the Water Gas obtained by the Galy-Cazalet Process.

It has been seen that the 1000 kilogrammes of coal, the distillation of which produced illuminating gas, left 670 kils. of coke in the cupola at the time that water gas was about to be made by the apparatus. It would require, in the first place, the combustion of 60 kils. of coke to raise the heat of the remaining mass to 1200°. The 603 kils. of coke, after deducting the useless cinders, would be reduced to 555 kils. of carbon available for absorbing oxygen from the steam. During the operation, it would be also necessary to burn 93 kils. of coke to restore to the mass the heat carried off by the gaseous products. The weight of steam necessary for the production of the gas is 1207 kilogrammes. The 1719 cubic mètres of gas delivered at the gasometer, and the absorption of the carbonic acid, require 1510 kilogrammes of quick-lime. Upon these data, the price of the gas obtained is thus reckoned:—

670 kils. of coke, at 0·03 fr.....	20·10 frs.
160 kils. of coke burned, and cost of the blowing-engine	0·90
Cost of the production of 1207 kils. of steam, taking into account the cessations of action of the generator on the one hand, and on the other the heat lost by the cupola, and required for the production of steam ..	5·00
Loss on the price of the lime after being recalcined	24·00
Cost of the engine and of the additional labour for the purification of the gas and the absorption of carbonic acid	3·00
Cost of 1719 cubic mètres of water gas	53·00 frs.
For a single cubic mètre*	0·0308

It is interesting to compare this elementary price with that which has been attained in the manufactory of Messrs. Christofle, where M. Gillard's apparatus is employed. To obtain 100 cubic mètres of the gas composed as already stated, there are expended, according to the statements which have been given us—

18 kils. of small coal, at 0·10.....	2·80 frs.
70 kils. of coal for heating the retorts, at 0·03.....	2·10
Cost of generating 120 kils. of steam	0·60
Revivification and loss on 80 kils. of lime for purifying..	1·20
Labour	1·00
	7·70 frs.
Maintenance of ovens and retorts	1·40
Cost of 100 cubic mètres of gas (Gillard's system) delivered in the gasometer	9·10 frs.
And for 1 cubic mètre†	0·091

* About 3d. per 1000 cubic feet.

† Equal to 1s. 8½d. per 1000 cubic feet.

To compare this with the cost of the gas obtained by M. Galy's process, we should add to the cost of the latter, previously stated at..... 0·03080 frs.
Maintenances of the cupola ..... 0·00062
Labour ..... 0·00010

Price of one cubic mètre of water gas, delivered in the gasometer by Galy's system..... 0·03152 frs.

The cost of manufacturing water gas by the Galy process would then be only about one-third that of the gas obtained by the process and apparatus of M. Gillard. But the amount of 0·03152 is only one of the elements of the cost price which we are endeavouring to find out; and we must now take into account the complementary amounts, which will enable us to determine the real price of the cubic mètre of water gas produced in one of the central gas-works, and conveyed by a system of pipes similar to that by which the gas for lighing is at present distributed.

The consumption of a gaseous combustible would have an extended development, and the value of most part of the elements that we are about to add to the cost price would diminish more and more, according as the quantity of gas consumed should increase; but, in order to limit our calculation to an amount, the realization of which would be relatively prompt, we will suppose, with M. Galy, an annual consumption of 100,000,000 cubic mètres. This amount will appear very small to those who consider that 25,000,000 cubic mètres of illuminating gas are annually consumed in Paris, and who consider also the vast weight of fuel every year consumed for domestic use by the Parisian population. On this basis, the cost price will be as follows:—

Cost of making 1 cubic mètre delivered in the gasometer	0·03152 frs.
Waste of gas in the pipes, 30 per cent.	0·00946
Cost of repairs of gasometers and pipes	0·01000
General expenses of distribution and management ..	0·00281
Tax on the pipes	0·00200
Octroi on the gas intering Paris	0·01000
Interest on capital.....	0·00975
Cost of a cubic mètre of water gas delivered at the burner.....	0·07554 frs.

We can now form a comparison between the cost of heating by gas and that of common fuel.

One cubic mètre of water gas, costing 0·07558, would produce in burning 2988 degrees of heat. We have seen already that, to obtain the same amount of heat, it would be necessary to burn—

0·43 kils. of wood charcoal....	at 0·12 fr.	0·0204 frs.
0·40	„	coal	0·03.....	0·0120
0·46	„	coke.....	0·03.....	0·0138
1·07	„	fire-wood.....	0·04.....	0·0428

We shall again insist on what we have already said when we compared the heating by gas with the usual methods. The great advantage of water gas employed as fuel, in comparison with coal, coke, wood, and charcoal, is not confined to the small price at which an equal amount of heat is developed; it depends especially on this certain fact—that a jet of gas directed against a body to be heated, imparts to it instantly the greater part of the heat produced by its combustion. If we refer to the numbers which have been already given, when putting prominently forward the comparative values of water gas and solid combustibles, we obtain the following results:—

One cubic mètre of gas applied to heating for domestic purposes, and costing 0·07554 frs., will produce the same useful effect as that due to the combustion of

6·07 kils. of fire-wood	costing	0·242 frs.
2·61	„	coke	„	0·079
2·30	„	coal	„	0·069
2·44	„	charcoal.....	„	0·097

Thus the heating by gas, for culinary and domestic purposes, would be as economical as heating with coal, without having any of its inconveniences, and would be cheaper than other fuels. If we add to this statement the power of instantaneously lighting and extinguishing the gas, and the avoidance of smoke—an object so much desired, yet so little and so irregularly realised—we shall perceive what strong recommendations attend a system of producing gas which enables that combustible to compete, with so many advantages, against all others. Let us observe, nevertheless, that coal would possess a great advantage over water gas for manufacturing uses, if we were to leave out of the question the smoking chimneys, and consider only the economy of the fuel.

(To be continued.)

Correspondence.

ANDERSON'S EXHAUSTER.

Sir,—I observe in your issue for the 5th of February, while writing on the desirability of the use of clay retorts in cheapening the cost of gas, you refer in favourable terms to the efficiency of my exhauster, for which I beg to thank you, and to request you to correct the statement that, amongst other places which you name, it is at work at the Woolwich Consumers' Company. My first exhauster, upon the success of which the patent was taken,

was temporarily fixed at the works in question, but afterwards removed, the company having one of their own; and as I have many applications as to where they may be seen in action, I beg your insertion of this letter, that my friends may not run the risk of performing a useless journey.

GEORGE ANDERSON.

4, *Portland Terrace, Rotherhithe,*
March 3, 1856.

Register of New Patents.

2107.—PIERRE GÉDÉON BARRY, of Gray Town, in the French Empire, chemist, for "*Improvements in treating bituminous shale, Boghead mineral, and other like schistous bodies, in order to obtain various commercial products therefrom.*" Provisional protection only obtained. Dated Sept. 18, 1855.

The inventor operates upon the schistous bodies in order to obtain essential and unctuous oils.

1. Highly rectified mineral oil;
2. Mineral oil for lighting purposes;
3. Fat, unctuous paraffinised (*paraphinée*) oil; and,
4. Mineral grease, through certain apparatus, as follows:—

Retorts and a receiver are made use of for decomposing the schistous bodies. The pipes which lead the gases from the retorts enter partly into the receiver, which is placed at some distance from the retorts. A condeser, provided with refrigerating tubes, condenses the raw oils and the ammoniacal waters. Purifiers formed of two wooden cases or jackets, lined throughout with lead, and provided each with an agitator, are employed to place the oils (after having been separated from the thick tar, as will be hereafter explained) in contact with 5 per cent. by weight of sulphuric acid of commerce. The matters must be agitated or stirred for about three hours, then left to settle, and drawn off into a second purifier placed under the first, where they have added to them about 5 per cent. by weight of caustic soda, or a sufficient quantity of lime-water; and the whole is to be well stirred for several hours, and then allowed to settle. A distilling apparatus for the raw oils is composed of a cucurbit placed over a furnace; it is fitted with a man-hole for clearing it out, and communicates by a pipe with a coil, from which the products of distillation are discharged into a receiver.

After submitting the raw oils to a primary distillation, in order to separate them from the pasty or semi-liquid tar which remains in the cucurbit, and from which it is drawn while still hot, the oils are heated successively with sulphuric acid, caustic soda, and lime-water, and are then redistilled in such a form of still as that employed in the distillation of molasses or rum.

The oils separated from the thick tar yield, under a properly regulated distillation, the light essential oil, the first streams of which are of about 70° of density of Gay Lussac's areometer. Distillation is carried on until the stream of liquid reaches a density of 50°. The first results, being the very light essential oils, should be collected separately; and, proceeding with great care, the next batch, until it attains 32° of the aremometer, may also be collected, and used for lighting purposes. The process of distillation may be further proceeded with; but the heat must be progressively increased, and the product resulting will be unctuous oil, fit for greasing and lubricating. A nearly liquid tar, or tarry matter, will still remain in the cucurbit, which may be converted into a black grease by mixing with it 10 or 15 per cent. of liquid caustic soda at 36°. After being well stirred at a temperature of 25° to 30° (centigrade) above zero, for about two or three hours, saponification takes place; and, the matter being run into appropriate receivers, forms what may be termed mineral paraffinised grease. After obtaining lighting oils at 32°, as hereinbefore stated, that which is afterwards produced is deprived of all light liquid; and all that remains is to separate the paraffine which is contained with it. For this purpose, the unctuous oil is placed in refrigerators with double bottoms, wherein it is submitted to a low temperature, at which the paraffine will be separated; and the remainder is gathered in bags, and submitted to pressure, in order to extract whatever little oil it may contain.

By means of ice and sulphate of soda, a temperature from 10° to 20° (centigrade) below zero may be attained. In the decomposition of schistous substances the heat for the production of the oily matters must never exceed 200° to 300° centigrade (392° to 572° Fahr.); for, if carried beyond, all the gases would be converted into carbonated hydrogen and carbonic oxide, to the detriment of the hydro-carbonated and hydro-carburetted liquids which are obtained.

PROVISIONAL PROTECTION

HAS BEEN GRANTED FOR THE UNDERMENTIONED INVENTIONS.

549.—THOMAS LAMBERT, of the New Cut, Lambeth, for "*Improvements in apparatus for regulating the drawing off of water and other fluids.*" March 4, 1856.

608.—JOSEPH STURGE, of Kennington, in the co. of Surrey, and ALFRED STURGE, of Northfleet, in the co. of Kent, engineers, for "*Improvements in rotary fluid meters.*" March 13, 1856.

611.—GRAND DE CHATEAUNEUF, of 39, Rue de l'Echiquier, Paris, and of 4, South Street, Finsbury, London, civil engineer, for "*A hydropneumometric gas meter.*" March 13, 1856.

NOTICES HAVE BEEN GIVEN OF INTENTION TO PROCEED WITH THE UNDERMENTIONED PATENTS.

2602.—WILLIAM SMITH, of 10, Salisbury Street, Adelphi, civil engineer, for "*Improvements in gas regulators.*" Nov. 19, 1855.

403.—HYAM JACOB HYAMS, of Stanhope Street, Hampstead Road, in the co. of Middlesex, gas-meter maker, for "*Improvements in the construction of gas-meters.*" Feb. 16, 1856.

516.—RICHARD ARCHIBALD BROOMAN, of 166, Fleet Street, in the City of London, patent agent, for "*Improvements in treating bituminous shale, Boghead mineral, and other like schistous bodies, in order to obtain various commercial products therefrom.*" Feb. 28, 1856.

514.—CHARLES ALEXANDRE DE FONBONNE, of Paris, for "*Improved apparatus for the manufacture of coke and for blasting; also for the production and extracting of illuminating and combustible gas, as well as ammoniacal and bituminous matters, part of such apparatus being applicable to the consumption of smoke.*" Feb. 28, 1856.

Legal Intelligence.

NORFOLK CIRCUIT.

HUNTINGDON, March 18.

CROWN COURT.—(Before Chief Justice JERVIS.)

George Squire was indicted for stealing gas, the property of the St. Neot's Gas and Coke Company.

Mr. O'MALLEY, Mr. Serjeant WELLS, and Mr. BURCHAM appeared for the prosecution; Mr. Serjeant BYLES and Mr. PRENDERGAST, Q.C., defended the prisoner.

The prisoner is a merchant and miller at St. Neot's, and had some time ago taken an active part in the formation of the company which now prosecuted him. For the purpose of carrying on his business he occupied large premises, which were supplied from the prosecutors' works with gas, which ought to have passed through two of their meters. A considerable part of it, there was no doubt, did so pass; but it was also proved that no less than six lights were fed from a pipe inserted into the gas company's service-pipe before it reached either of the meters, and that a seventh pipe was applied in a similar manner. Two years ago the principal gasfitter in the town was employed by the prisoner to lay the pipe which supplied the six lights; and he, while so engaged, complained that there was a great escape of gas at the junction, which could not be stopped; and on that occasion the ground was opened up, and the pipes publicly exposed to view for many days. Last month the prisoner sent for the company's own foreman to change the meters, which it appeared did not act well; and it was while this change was going on that the foreman discovered that the gas had been abstracted. On being told of this discovery, the prisoner remarked that "he was very glad it was found out, as he might have been robbing the company unknowingly for a long time."

Mr. Serjeant BYLES addressed the jury, and argued that the whole circumstances and conduct of the prisoner proved that the placing of the pipe where it was was nothing more than an error; and, after having called witnesses, who gave the prisoner the highest character, the jury returned a verdict of Not Guilty.

PRESTON PETTY SESSIONS.

TUESDAY, MARCH 11.

PRESTON GAS COMPANY, *Appellants;* OVERSEERS OF PRESTON, *Respondents.*

Mr. SEGAR appeared on behalf of the appellants, with Mr. PAUL CATTERALL, jun., solicitor; Mr. ASTON for the respondents, with Mr. WATSON, solicitor.

The gentlemen upon the bench were—Messrs. Ainsworth (in the chair), R. Pedder, Lawe, Monk, and Paul Catterall. Some difference of opinion having been expressed by the learned gentlemen as to who should open the case, the bench ruled that the respondents should begin, that being the practice of quarter sessions.

Mr. ASTON then rose, and said he appeared in support of a rate made by the overseers of Preston, in the month of October last, for six months, at 1s. 2d. in the pound, upon the property of the Preston Gas Company, who were assessed to the poor rate at £3500, as being the net rental of the works in the borough of Preston. He might remark here, that the question would be, not so much as to whether the company was rated too high, but whether they were not rated too low. It had been thought that the dividend paid by the company was £5000, but the respondents had, since the rate was made, found that it was £7800. In 1838, the company was rated at £1200, which had since been increased by small amounts till October last; just before that, he thought it was £1900 and some odd pounds. The learned gentleman then quoted the various acts of Parliament that had been obtained by the company for extension of works, the raising of additional capital, &c. By the 8th Vic., c. 15, sec. 121, the company were not to make any dividend on the capital stock; by the 38th section, it was prrovided that the accounts should be filed. The accounts had been asked for by the respondents, but the company had not thought proper to give them. The account, of which the bench would get a copy from the clerk of the peace, was of general expenditure, and mixed up both capital and profits. Having the best means of enabling them to arrive at a correct conclusion, the company had refused to give them those means. He then quoted from the judgment in a similar case, brought by the London and Brighton Railway Company, to show the difficulty of rating railways; and that the Preston Gas Company should have, and ought to have, given the overseers all the information that it was in their power to give. Mr. Aston said he need not dwell upon the fact that the town had increased considerably, and submitted that the real question was, what was the net sum for which the property would let? It would be a difficult question to ascertain what property would let for which really never was let, and where there was no demise. The court must take particulars as nearly as they could be got. In a case, "the King *v.* the Cambridge Gaslight Company," the company was held rateable as occupiers of land, but not for profits in trade. It might be said that some parts of the works were not rateable to the parish of Preston, but they must take the value of the works in this parish. He referred to the report of the directors at the annual meeting on the 14th of January last, which spoke of the rapid increase in the number of consumers of gas. Supposing the rate laid in 1838 was a fair one, which the court had a right to assume, then it was a question of increased capital, which he would put in this way:—If £30,000 expended in 1838 gave for the rental £1200, what would £87,000 give? The company might say that that provided for everywhere. Well, they could not deduct for what was outside the parish more than one-twentieth. But could any one say, that if they were going to let the premises, they would not want more on account of the increase of the town than they would have asked in 1838? Undoubtedly they would, supposing the rate in 1838 to be reasonable.

Mr. SEGAR: If you will give us 9s. per 1000 for our gas, we will not repudiate the rate now.

Mr. ASTON continued: He did not want the court to assess the company on their profits. He merely wanted to show what would be a reasonable rent for such a business. His witnesses would be perfectly willing to take the works off their hands at a rent of £3500 a year. He then called for the accounts.

Mr. SEGAR handed in a statement of accounts, and said: Of course you will put it in, now that I have given it to you.

Mr. ASTON: I shall not put it in; it is not the account I called for. I shall put in the rate-books.—He then called

Mr. *Johnson*, assistant-overseer, who produced the rate-book for 1838. In that year the Gas Company were rated at £1200.

Mr. SEGAR: Was that before the act of Parliament was obtained? That company is not this company. It was incorporated subsequently to that period, if I understand my friend's dates rightly. The first act was obtained in 1839. The rate spoken of now was laid in 1838; we were not in existence at that time.

Mr. ASTON: The company of 1839 is not in existence now. The act repudiates and dissolves the old one altegether! Who ever heard of such an objecton as this?

Mr. *Johnson's* examination continued: The rate of the Preston Gas Company in 1838 was upon an assessment of £1200. There was no description of property. There was no other gas company. I think there was a private company.

Mr. SEGAR: That rate would be for the private company perhaps?

Mr. *Johnson*: It was for the gas company in question.

Mr. SEGAR: How do you know that?

Mr. *Johnson* gave several names from the list of the company in 1838, and said the same names appeared in the act of incorporation.

Mr. ASTON: Produce the rate-book of 1855.

Mr. *Johnson* produced the book, and stated that £1963 was the sum at which the company were assesed to the poor-rate previous to the laying of the rate now appealed against. £3520 was the assesment appealed against. It was laid in November last, and at 1s. 2d. in the pound came to £205. 6s. 8d.

By Mr. SEGAR: The works have increased much of late years in actual construction. In making your present assesment, have you assumed that the assessment of £1200 in 1838 was a proper one?

Mr. *Johnson*: I say nothing about that; we find that the premises were rated at that at the time.

Mr. SEGAR: But whether it was right or wrong you can't tell?

Mr. *Johnson*: We can only say that it was rated at that, and the company paid it.

Mr. SEGAR: Was £1963 a proper assessment?

Mr. *Johnson*: The company paid that also.

Mr. SEGAR: That was the rate in 1855?

Mr. *Johnson*: Yes, sir.

Mr. AINSWORTH: This is the second rate for 1855?

Mr. *Johnson*: Yes; and there were some additional new buildings which brought up the assessment to the present rating.

In answer to Mr. SEGAR, the witness said he did not think the assessment of £1963 at the beginning of 1855 was a right one.

Mr. ASTON here produced and read some correspondence which had passed between the solicitors of the overseers and the gas company, to show that the information sought by the former had been refused by the latter. He supposed——

Mr. SEGAR: Is my friend giving evidence now, or making a speech? (Laughter.)

Mr. *Rd. Veevers* was then called on behalf of the respondents. He had given his attention to the value of the gas-works—of that portion of the property which was rateable to the poor. Had gone through the accounts for 1854 and 1855, and made the rateable value of the property in the township of Preston to be £4547. 10s. 4d. He believed a tenant would give that sum, paying all the rents and taxes. Did not think the gas company, as landlords, would let them for that. The witness went through the accounts, and explained how he came to the above conclusion.

Mr. SEGAR: You exclude bricks in your calculation?

Witness: Yes.

Mr. SEGAR: Why so?

Witness: Because part of them were for extension and part for repairs.

Mr. SEGAR: Although these are items professing to be for expenditure, yet you exclude some part for extensions.

Witness: Yes. I do.

Mr. SEGAR: Would you keep your accounts that way?

Witness: No.

Mr. SEGAR: But you the think the company keep their accounts that way?

Witness: Yes.

Mr. *Job Bentley*, valuer, of Kendal, was then called by Mr. ASTON, and deposed that he had been in business upwards of twenty years. He had had the accounts laid before him. Had formed an opinion that the works should be rated at £4410.

By Mr. SEGAR: I have seen all the works above ground. The measurement of the mains was furnished to me by Mr. Veevers.

By Mr. ASTON: I have had some experience in water-works.

Mr. *John Cross*, surveyor, of Bury, was next called. He considered that the rateable value of the gas-works, according to law, was £4229. 6s. 4d. Did not think the company would advertise them to be let at that rent.

Mr. ASTON said that was the case.

Mr. SEGAR then rose, and said his friend had taken an estimate substantially founded on the account of 1855. He would not trouble the court with any remarks as to the old rating, because it was said that the present rating was not based upon that, but was an entirely new rating. The basis on which his friend had proceeded was the account for 1855, which had been filed by the clerk of the peace, and from which the several witnesses professed to get an account of the actual net revenue, over and above the expenditure, at least for that particular year. They then made certain allowances necessary for maintenance, and all the rest, they said, was liable to be rated. The question, as his friend had said, was, at what rent those premises would let—the premises that were rateable;—not at what rent the entire business might be sold at, because the profits arising from manufacture was not rateable at all. There was no distinction between the manufacture of gas and that of textile fabrics, machinery, or anything else. The profits of trade were not now rateable, and therefore must be entirely excluded in the consideration of this question. Let them endeavour to ascertain at what sum the premises would let, by separating, if they could, the revenue which was derived from the occupation of land from that which was derived from trade. That might be a matter necessary to be considered with regard to railway and water companies; but it was altogether different with regard to gas-works, for no profit whatever was derived from the occupation of land; it was entirely from the manufacture of gas. Let them cut off the gas mains, and then what possible difference was there between gas-works and any other manufacturing establishment? They were all precisely on the same footing. No profit whatever was yielded from the occupation of land, but from the premises on which the works were conducted; and whether the the trade was profitable or not, they were equally liable to be rated. They might be carrying on the business at a loss, but they would not be entitled to say they would not be rated. The question of profit, therefore, had nothing to do with it. The court was at liberty to say what the premises would let for from year to year, bearing in view that they must ascertain really what the rateable occupation is; and, secondly, what a tenant would give for the property, being rateable. He apprehended there was no difficulty whatever in the rating of the property, or of the property of gas companies generally. In the case of a water company, the occupation of land was in itself, *per se*, rateable; in the cases of railways, complications arose partly from the occupation of land and partly from the carrying on of the trade; but the case before them was entirely one of trade. Referring to the occupation of land by means of pipes, the learned gentleman said the court must use its judgment with respect to that liability, and then called their attention to the fact, that before the act of Parliament was obtained the company had 9s. per 1000 cubic feet of gas, but that the price was now reduced to 4s. 9½d. They were compelled to sell gas, but were restrained from charging more than the sum specified. [Mr. ASTON: Within the borough?] Of course; and they were liable to be called on to put down mains wherever they might be required. Although he did not contend that they should be excluded altogether from the liability to be rated in respect of land, yet it would be unjust to charge for the occupation of the land by the mains in respect of the profit derived therefrom. A fair measure of the value of that occupation would be the cost incurred in putting down the mains. The land so occupied was, *per se*, of no value whatever. It was quite clear that no tenant would take those strips of land in which the mains were laid down; but to the company they were of a certain value. Mr. Segar then cited a number of figures to show that the net receipts of the company, by the past year's transactions, amounted to £5126.

Mr. AINSWORTH: How did you pay a dividend of seven thousand and odd pounds?

Mr. SEGAR: We drew upon the reserved fund for the purpose. The shareholders are entitled to have their dividend; but we have not been able to keep it up from the profits, and therefore fell back upon the reserved fund. Our entire income was £5126; but it is perfectly clear that but a small portion of that could be rated. It is very obvious that the greater part of it must arise from the carrying on of trade, which depends on the price of coal, the number of consumers, &c. The real question is, at what the rateable property could be let, and not at what the trade could be transferred. He then called

Mr. *Fisher*, valuer, of Manchester, who, after giving an elaborate calculation of the value of the different descriptions of property in the Lawson Street, Glover Street, and Walker Street yards, stated that he estimated the net value of the rateable properly to be £2114. 16s. 7d.

By Mr. ASTON: I have not put gasholders into my calculations, because I don't consider them rateable property.

Mr. ASTON; Why not?

Mr. *Fisher*: I don't know; they have never been treated as such in my experience.

Mr. ASTON: Do I understand you that the sum you have named, two thousand pounds odd, is the rent at which the works might be expected to let at from year to year?

Mr. *Fisher*: That is the rateable value.

Mr. ASTON: Answer my question. What I ask you is—Do you consider that £2114 is the net annual value of the gas-works to a tenant for the purpose of carrying on the work?

Mr. *Fisher*: It is the net rateable value.

Mr. ASTON: It is the rent?

Mr. *Fisher*: It is the net rateable value.

Mr. ASTON: That is not the question. Supposing you were asked the rent they ought to carry, what would you say?

Mr. *Fisher*: I should say the gross rental would be £2441. 13s. 7d.

Mr. ASTON: Notwithstanding that the business has been carried on for so many years, and is able to pay a dividend of 10 per cent.? You think, supposing the capital to have been expended, £87,000——

Mr. *Fisher*: I don't know that that sum has been expended.

Mr. ASTON: Supposing that sum to have been expended for carrying on the trade, you give as your estimate that the rent for which they would let would be only £2441? What is the gross saleable value?

Mr. *Fisher*: Altogether £35,000.

Mr. ASTON: You value the works of the company at that?

Mr. *Fisher*: There are the retorts in addition, £4000; gas-holders, £1000. I make the whole value of purifiers, large meters, exhausters, condensers, connection, washers, &c., to be £13,697—not included in the rating.

Mr. ASTON: Then why did you value them?

Mr. *Fisher*: To be prepared to answer any questions that might be asked.

Mr. *David Bellhouse*, Manchester, gave the results of a valuation he had made upon the ordinary and recognised principle. By his calculations he made the gross estimated rental £2446. 14s. 7d., and the net rateable value £2108. 3s. 2d.

Mr. *Rolfe*, managing engineer of the gas-works, said that last year the company paid a dividend of £7800, £2545 7s. 8d. of which, was paid from the reserve fund.

Mr. ASTON: Is not the business better now than it was in 1854?

Mr. *Rofe:* Yes, because there was a stoppage of the works in that year.

Mr. SEGAR: But if there was a stoppage of the profits, I suppose there would be no stoppage of the rating?

Mr. *Rofe:* There was not.

This closed the case for the appellants.

Mr. ASTON addressed the bench on behalf of the respondents. He referred to a case reported in the 5th Barnwell and Cresswell, the Queen *v.* the Brighton Gas Company, where it was laid down that the branches and pipes should be considered as part and parcel of the land; and this, he contended, was a complete answer to all which had been brought forward on the other side. In rating this property, it must be taken into consideration that a very profitable business was carried on, and to get at the value they must allow the tenant a reasonable profit, and then take the net receipts. The question before the court was, what would these things let for as gas-works; and in that they must take into consideration all parts of the building and all the materials. The overseers had estimated the rental at £3500 a year, and the question ought to be, not whether this was too much, but whether it was not too little; for he was quite sure that the gas company, if they wanted to let the works, would not let them for £3500 a year. He submitted that the appellants had not come there in good faith to make out to the bench that they were unfairly assessed, when they made out their estimated rental at £1270 a year, when in point fact they were paying a dividend of between £7000 and £8000. In conclusion, he contended that he had made out a strong case; that the sum at which the gas company had been rated was a fair and an equitable one; and he called upon the bench to confirm the amended rating.

The magistrates consulted for a few minutes, when Mr. AINSWORTH said: The court will adjourn this case for a week, and in the meantime give it their best attention.

TUESDAY, MARCH 18.

In accordance with the arrangements come to on the hearing of this appeal, on Tuesday last, the magistrates will now proceed to pronounce their judgment. The conclusions at which they have arrived are the result of much careful consideration. Several difficulties have arisen in the course of the inquiry, and to some of the bench the propriety of including the meters of the company in the assessment has appeared so questionable, that they have been unable to arrive at a unanimous opinion upon this point, and the judgment pronouncing them to be rateable must therefore be considered as the decision of a majority only. Two modes have been suggested by the overseers and the gas company of arriving at the annual value of the company's works, for the purpose of rating. 1. By taking an account of the receipts and expenditure, allowing for tenants' profits, renewal, and depreciation. 2. By a valuation of the works, calculating the annual value thereon to a tenant, and allowing for depreciation, insurance, taxes, &c. As regards the first mode, the accounts put in by the overseers and the company were so conflicting, that it was found impossible to arrive at anything like a correct statement of facts. The second mode is, no doubt, the correct one; and being in accordance with the Parochial Assessment Act, the magistrates decided upon adopting it. The valuations put in by the overseers were incomplete, in not carrying out the calculations as to the annual value, and as to depreciations; and as the valuations put in by the company exceeded the overseer's, the magistrates have taken Mr. Fisher's valuation as the basis of their calculations. In justice to the valuers on the part of the overseers, the magistrates would observe that the incompleteness of their valuations is, no doubt, to be attributed to the fact that these gentlemen had not at their command the same facilities for making their calculations as the company would doubtless afford to their own surveyors. Mr. Fisher has omitted to take into account two important items which the magistrates have added to his valuation, viz., the gasholders, purifiers, &c., which he valued at £13,697; and the meters, which Mr. Rofe valued at £8000. As to the gasholders and purifiers, the magistrates have had no difficulty, and are unanimous in the opinion that they are rateable property—the recent cases cited by the respondents' counsel clearly settling that question. But as to the meters, they had considerable difficulty in determining—first, whether they are rateable property; and, secondly, whether the company, or the person on whose premises the meter stands, are the parties to be rated. The act 16 Vic., c. 13, sec. 35, gives the company power "to lay any pipe, branch, or other necessary apparatus, from any main or branch pipes into, through, or against any building, for the purpose of lighting the same; and to provide and set up any apparatus necessary for securing to any buildings a proper and complete supply of gas, and for measuring and ascertaining the extent of such supply." This clause clearly contemplates meters as forming part of the apparatus for carrying on the business connected with the gas-works, and gives the company power to put them into any building, the same as pipes into or through the soil, from which a right to occupy the land and buildings upon which they stand, or are attached for that purpose, might fairly be implied; and those meters being attached to the service-pipes of the company, a majority of the magistrates consider that they form one part of the machinery and apparatus of the gas-works, and are, therefore, rateable property, in the same way as the service-pipes, about which there is no dispute. The question, then, arises as to who are rateable in respect of those meters. The tenant may be said to be the occupier of the meter, as he pays a rent, or rather a tax, for it to the company. The company may be said to be the occupiers, under their act of Parliament, of that part of the land or building upon which the meters stand, or against which they are set up, in the same way as they are considered the occupiers of the soil through which the service and main pipes pass. The company have also, by their act of Parliament, the full control over the meters, which are their property, and protected from seizure. The meters do not enhance the value of the occupation to the tenant, but are of considerable advantage to the company. The meters are not used by the tenant for the purposes of trade, but simply as a means of ascertaining between him and the company the quantity of gas consumed, and it was not shown that tenants were rated any additional sum for them. After a full and careful consideration of these several points, a majority of the magistrates have come to the conclusion that the company are rateable for these meters, as for any part of the machinery or apparatus attached to the gas-works.

Mr. AINSWORTH then handed in a statement, showing the different descriptions of property belonging to the gas company which are rateable to the poor, and the gross, annual, and rateable value of each, the result of which showed a reduction upon the overseers' assessment of rateable value amounting to £277. 2s. 7d.:—

	Gross Value.	Annual Value.	Rateable Value.
	£ s. d.	£ s. d.	£ s. d.
Land—Glover Street	4,068 0 0		
,, Walker Street	681 15 0		
,, Lawson Street	2,171 10 0		
	6,921 5 0		
Annual value, 5 per cent.		346 1 3	
Deduct 5 per cent.		17 6 1	328 15 2
Buildings and power	9,025 13 5		
Annual value, 6½ per cent.		586 13 5	
Deduct 1-6th for insurance, dilapidations, &c.		97 15 7	488 17 10
Tanks and mains	19,144 12 0		
Annual value, 6½ per cent.		1,244 8 0	
Deduct 1-10th for depreciation		124 8 9½	1,119 19 2½
Retorts	4,085 0 0		
Annual value, 6½ per cent.		265 10 6	
Deduct 1-3rd for depreciation		88 10 2	177 0 4
Gasometers, purifiers, &c.	13,697 0 0		
Annual value, 6½ per cent		890 6 1	
Deduct 1-5th		178 1 2	712 4 11
Meters	8,000 0 0		
Annual profits, 6½ per cent.		520 0 0	
Deduct 1-5th		104 0 0	416 0 0
Rateable value			£3,243 0 5

Mr. ASTON, the counsel for the respondents, said the overseers were perfectly satisfied with that decision; and he would ask the appellants whether they intended to abide by it? If they did intend to be bound by it, he was instructed not to ask for costs; but if they contemplated carrying the appeal to the court of quarter sessions, then he should ask for costs.

Mr. PAUL CATTERALL, jun., solicitor for the appellants, said that, in the absence of Mr. SEGAR [the counsel], he could not answer the question; but it was his own opinion that, as the appellants had succeeded in diminishing the assessment, they were entitled to costs—at all events that that they should not be asked to pay any.

A notice of appeal against this decision was subsequently given by the gas company.

Miscellaneous News.

THE METROPOLITAN BOARD OF WORKS.

WEDNESDAY, MARCH 19.

The board met at Guildhall this day, at twelve o'clock—Mr. THWAITES in the chair.

The minutes of the last meeting were read and approved.

ACCOUNTS OF THE BOARD.

The CHAIRMAN stated that he had transferred from the London and Westminster Bank to the Bank of London, the treasurers of the board, the sum of £8258. 12s. 8d. during the previous week. With regard to keeping the accounts of the board, it had struck him that it would be advisable to separate them in the following order—viz., a distinct account for the ordinary sewerage works, another for the surface or metropolitan works, and a third for the great subterranean tunnel. He apprehended that, in the opinion of the board, the cost of the latter should be extended over as long a period of time as Parliament might be disposed to sanction, inasmuch as they were constructing works not merely for the present time, but for posterity. (Hear.) By the arrangement and division of the accounts which he had suggested, they could be more easily dealt with; and he would recommend that it should be referred to the finance committee to examine and report thereon.

On the motion of Mr. WARE, the suggestion of the chairman was agreed to.

COMMUNICATION BETWEEN HYDE PARK AND BROMPTON.

A deputation from the inhabitants of Brompton, consisting of Captain Sir E. Belcher and Mr. J. Blore, attended, and presented a memorial in reference to the formation of an opening through the north end of Brompton Square, leading to Hyde Park, as a substitute for the present long and circuitous route. The memorial stated that the present means of access to All Saints' Church and the park were not only circuitous, but highly objectionable to ladies and children. All that the deputation asked was, a footpath sufficiently wide to admit of the passing of an engine in case of fire. The memorial was signed by 139 inhabitants.

The deputation having been heard in support of the application, replied to several questions proposed by the chairman and members of the board, as to the probable cost of the proposed alteration, and the difficulties likely to be interposed by the owners of property on the spot. They stated that the cost of the proposed alteration would only be about £150, and that they did not apply to the board for money, but for power to carry out their object. On the deputation retiring,

The memorial was ordered to lie on the table.

APPOINTMENT OF HOUSEKEEPER.

A report from the committee on salaries and duties of officers was brought up and read, recommending that George Edward Boggis and his wife be appointed during the pleasure of the board to perform the duties of housekeeper, and take charge of the premises in Greek Street, at the annual salary of £100, with free residence, coals, and candles, and an allowance of £30 per annum, for the maintenance of a servant.

Some conversation ensued on the motion for adopting the report; one of the candidates being, as was supposed, a few months older than the age prescribed by the board. Ultimately the question stood over, and Mr. Dalton gave notice for the next meeting to rescind the resolution already adopted on the subject.

ACCOUNTS OF THE LATE COMMISSION.

The financial statement of the late commissioners was brought up, received, and ordered to be printed and sent round to the members.

OFFICES OF THE BOARD.

Mr. SKELEY then brought forward the following motion, of which he had

given previous notice:—"That the resolution of the board on the 14th of January last, adopting the report of the committee on the site of offices, and referring it back to the committee to prepare plans for the adaptation of the premises in Greek Street, as recommended, and submit such plans to the board for approval, be altered in the manner following, viz.:—That, having reference to the report of the committee as to the site of offices made on the 14th of January, in which the expediency of enlarging the house in Greek Street is rested on 'the difficulty in obtaining a site or premises in a more central neighbourhood,' it be an instruction to the committee to suspend the adoption of any definite plan for the enlargement of the house in Greek street until it has ascertained whether it may not be practicable to obtain a site either near the Sessions' House, Clerkenwell, or in Giltspur Street, adjacent to Christ's Hospital, or on the vacant ground in Farringdon Street, or in Bridewell Hospital, or in some equally central situation." He said the object which he proposed was, not to obtain a vote of the board adverse to the continuance of the Greek Street premises as the meeting-place of the board, but to prevent a decision in its favour being arrived at until some further inquiry was made by the committee. In selecting a place for the board to do its business in, the position should be as far as possible central, and of easy access. The report of the committee of the 14th of January fully admitted this principle; and also admitted that, in these respects, the Greek Street premises did not come up to the requirements of the board, although it adduced certain reasons why they should still be retained. A very eminent man—a member of the board—had stated that the centre of the board's operations was the Elephant and Castle, on the Surrey side of the river. Theoretically, this might be correct; but it would, in a practical point of view, be found to lead to very erroneous results, which to business men would be of serious importance. He found that, of the members of the board, 15 lived on the west side of Temple Bar, and 24 on the east of it. Again, 19 of them lived on the west of St. Paul's Cathedral, and 20 on the east of it. He therefore contended that, for practical purposes, St. Paul's was, as near as possible, the centre of the board; and, having regard to the residences of its members, he proceeded to point out several places in the vicinity of that centre as suitable positions for the proposed offices of the board, including among others the neighbourhood of the Sessions' House, Clerkenwell; Giltspur Street, adjacent to Christ's Hospital; the vacant ground in Farringdon Street, the Bridewell Hospital, and the site of Covent Garden Theatre. The reasons assigned by the committee in their report why the board should still remain in Greek Street, were principally these:—first, the difficulty of getting a site anywhere else equally suitable; and, secondly, the enormous expense of removal. He had already answered the first of these reasons; and as to the second, he would remark that it had been estimated by the superintending architect to the board, that the necessary alterations in the premises at Greek Street, now belonging to the board, in order to adapt them to the purposes of the board, would cost £8500; though he estimated the cost of an entirely new building to be only £10,000. It was true that was exclusive of the cost of the site, which would be between £4000 and £7000; but that expense, he submitted, would be to a great extent diminished by the sale of the premises and site in Greek Street; and it would probably in the end not exceed a difference of £5000 to obtain offices in every way better calculated for the purposes to which they were to be devoted, than those they now possessed. There were probably a million of people living to the east of St. Paul's who would have business to transact with the board, and whose convenience, to some extent at least, ought to be consulted. As far, too, as the members themselves were concerned, if they removed their place of business far from their own residences, they lessened the power of the board by diminishing the probability of regular and constant attendance at their various meetings. On all these grounds, he thought there was sufficient reason to justify further inquiry by the committee.

Mr. CARPMAEL seconded the motion. He voted for the first report on the understanding that £1500 or £2000 only was required to adapt the Greek Street premises to the use of the board; but, as he now found the sum to be expended was necessarily much larger, he thought further inquiry should be made.

Mr. DIXON supported the motion. He did not like returning to Greek Street, which had been the battle-field of several former commissions; and, as the inhabitants of the metropolis east of the City would have to pay the greatest proportion of the taxation, he thought their convenience ought to be somewhat studied.

Mr. NICHOLAY said he would vote for the motion, not for the purpose of deciding against Greek Street, but to afford the committee an opportunity to see whether they could not do better.

Mr. DALTON contended that it was not so much a central position that was wanted as one that was easily accessible; and he moved, as an amendment, that the motion be altered so as to stand, "That it be an instruction to the committee to suspend the adoption of any definite plan for the enlargement of the house in Greek Street, until there has been further inquiry whether it might not be practicable to obtain a site either in the neighbourhood of Charing Cross or Whitehall, or some other equally accessible situation."

Mr. WILKINSON seconded the amendment, contending that accessibility, and not centrality, was the great point to be considered in this matter.

Mr. HOWS thought the board were much indebted to Mr. Seeley for the trouble he had taken in the matter. He confessed that the house in Greek Street was not what he once thought it was, and from its situation it involved great waste of time in attending meetings of committees.

Mr. H. L. TAYLOR also supported the motion.

Mr. DOULTON said, he should like the places named in the motion to be omitted, as the points referred to were not all of them central positions. The honourable member (Mr. Seeley) seemed to have a strange liking for places of confinement, as he had named the Clerkenwell Sessions' House, the Giltspur Compter, the site of the Fleet Prison, and Bridewell Hospital. ("Hear," and a laugh.) He (Mr. Doulton) might inform him that the most central spot in the metropolis was the neighbourhood of Bethlehem Hospital, or the Queen's Bench Prison—(renewed laughter)—but neither of these places were, for practical purposes, as accessible as the neighbourhood of Charing Cross. By all means let them get away from Greek Street; as, after they had expended £10,000 upon it, it would still be an inconvenient place; and there were associations connected with it which it was desirable not to revive.

Mr. T. H. HALL said, the board seemed all of a mind that Greek Street must be given up. ("No, no;" and "Yes, yes.") Well, it certainly was the feeling of the majority, as they were clearly disinclined to spend £10,000 upon it. Then came the question, where could they find a more suitable situation——

Mr. SEELEY (interposing) said, in order to shorten discussion, he would consent to leave out of his motion the names of all the places to which he had referred. (Hear, hear.) The latter clause of the motion would then stand thus:—"Whether it may not be practicable to obtain a site in some equally accessible situation."

Mr. LESLIE objected to the motion, as it went to rescind a resolution of the board. The act of Parliament threw very great difficulties in the way of doing so, and very properly too. It appeared that the board had appointed a committee, and that committee had reported. (No, no.) Well, the resolution before them intimated as much, but it said nothing about the expenditure of £10,000, on which so much stress had been laid. He hoped the board would never agree to such an outlay; if so, Bridewell would be a very proper place for them to meet in. There was no fault with Greek Street; if any fault existed it was with the people who had met in it. The board had capital freehold property there, upon which a large amount of money had been expended; it was within a hundred yards of the great omnibus division of the metropolis, and the ratepayers had clearly a right to have good reason shown for its abandonment.

Deputy HARRISON replied to several statements made by Mr. Leslie. He contended that, after all the money which might be expended upon Greek Street, it would still be an inconvenient place, and certainly very inaccessible; whereas, for a comparatively small increased cost, they could have a building every way suited to their purpose in the heart of the great commerce of the metropolis.

Mr. DALTON accepted the alteration in Mr. Seeley's motion, and withdrew his amendment.

Mr. COLLINSON strongly opposed the motion, and asserted that the purchase of a site and erection of a new building would involve them in much greater expense than what had been stated. He believed that for £3000 they could improve the existing accommodation in Greek Street, and build a convenient board-room in the rear, which would answer their purpose to the full. They were not justified in so lavish an expenditure as that which the proposed removal and erection of a new building would involve, until in its practical operation the board had proved its value to the public.

Mr. WRIGHT said, the whole proceeding was irregular, as no report from the committee, and no plan from the architect, was before the board.

Mr. CRELLIN justified the course now adopted, and which was the result of experience gained since the report of the committee was brought up. He felt that those who looked to the board for the material improvement of the metropolis, would have little confidence in them if they exhibited such bad taste as to continue in Greek Street.

Mr. DENNIS supported the view taken by Mr. Collinson, and said he would pledge his reputation as a builder that a commodious building, to the satisfaction of every member of the board, could be put up for £3000.

Major LYON said there ought to be strong reasons for altering or rescinding any resolution of the board, and he had expected that Mr. Seeley would have given them some idea of the probable cost of the sites which he had referred to. He would, however, remind those who had spoken of the increased estimate of the architect, that at the first the erection of a board-room only was intended, but now the plans embraced no less than thirty-four rooms, and some of these were to be fire-proof. He felt, nevertheless, that the question was before the board in a very incomplete form.

Mr. Snow, Mr. Drew, and Mr. Offor supported, and Mr. Hawkes and Mr. Pascall opposed, the motion.

Mr. SEELEY having been heard in reply,

The motion was put to the vote, when there appeared—

For the motion	27
Against	9
Majority	—18

Mr. WARE withdrew his notice of motion, to declare as a main sewer the trunk sewer commencing at or near Beauvoir Town, Kingsland Road, and extending thence under the Regent's Canal, and along Kingsland Road to High Street, Shoreditch, where it joins the main sewer.

IMPROVEMENT OF METROPOLITAN THOROUGHFARES.

Mr. WILKINSON then, in accordance with his notice, moved, "That it be referred to the committee of works and improvements to take into consideration and report upon a comprehensive plan for making, widening, and improving streets, roads, and ways for facilitating the passage and traffic between different parts of the metropolis." He said that he did not bring this motion under the consideration of the board with any wish to divert their attention from the progress of the great sewerage question. It was compulsory on the board to carry out that great scheme, but they had only a permissive power with regard to the improvement of the metropolis in other respects. By organising, as they had done, at the instance of Mr. Wright, a committee of works and improvements, they had made the first practical step in the work of improving this city; but, unless they instructed that committee in the way in which they were to act, both the board and the committee would be placed in a position of difficulty, more especially as already several isolated schemes had been brought under the consideration of the board. It was to avoid the inconvenience of having to consider individual schemes, instead of some great comprehensive plan for improving the metropolis as a whole, to which, in his opinion, all local and individual schemes should be kept subordinate and made to bend, that he thought it desirable that some such general instruction as that contained in his motion should be given to the committee. The subject of metropolitan improvements had been so completely ventilated at the board, that he would not trouble them with any observations thereon. His idea was, that there should be one general reference to the committee; and his motion had been framed, after much care, in the exact words of the 144th section of the act.

Mr. WRIGHT seconded the motion. He said there was no question which had occupied the attention of the board so much as the one now before them; but the previous schemes brought under their notice for improvements were objectionable, in that they were isolated and unconnected with any general plan for improving the metropolis, besides being accompanied by demands that they should be carried into immediate action. The board had, up to the present moment, done all in its power to put in train the subject of intercepting the sewerage from the Thames, which was the primary object for which they were embodied, by referring it to their engineer to propound a scheme for carrying the work into execution; and therefore they were now at liberty to deal with the question of the general improvement of the metropolis in other respects. That being so, it would be desirable that the committee, to whom it was now proposed to refer the question, should be empowered to gather together and consider attentively the views and schemes now floating about London as to the improvement of the metropolis on a great and comprehensive scale. He did not think that it was probable any scheme would be so far matured as to go before Parliament this year; but he could conceive of many things by which they might gain information. The committee would do for the board, in the matter of improvements, what former commissions had done for it in reference to the sewerage; and as the committee had, he believed, the entire confidence of the board, he felt pleasure in urging them to adopt this resolution.

Mr. TURNER said the board had wisely, as he thought, refused to look at suggestions for isolated improvements; and he was glad that the present motion had been submitted. Still it required something to be added to it, so as to give power to the committee of works to take into consideration the propriety of preserving open spaces near the metropolis for the benefit of the inhabitants. He would therefore move that at the end of the motion the

following words be inserted:—"and also for providing or securing open spaces for the health and recreation, and otherwise, for the public benefit of the inhabitants thereof."

Mr. D'IFFANGER seconded the amendment.

Mr. BURSLEM approved of the motion and the amendment, and would vote for both.

Mr. HAWKES wished the board to pause and inquire from what source the money required for these improvements was to come. Certainly, if they were to be carried out, Parliament should be applied to for powers to tax a much larger district than the metropolis; and till that was done, the question now before them should be adjourned.

Mr. NICHOLAY said the question of providing money had not been fairly dealt with; and, unless the board were prepared to do something speedily, the Legislature and the public would naturally conclude that the bugbear of taxation intimidated the board from action. He contended that it was only fair to tax posterity to a certain extent for the improvements of the metropolis, seeing that it was chiefly for the benefit of posterity that those improvements would be made, if made at all.

Deputy HARRISON considered that Mr. Hawkes's remarks were hardly called for. He (the speaker) thought there was but one feeling at the board, and that was, that in whatever alterations they might adopt, the whole should have reference to some great scheme which the public would approve. It was now by the motion proposed to give to the committee the power to take a large and comprehensive view of a great question—the improvement of the streets and thoroughfares of the metropolis—and to submit their considerations to the whole board for its approval; and he could not conceive any more convenient mode of dealing with a question of that vast magnitude than the one proposed by Mr. Wilkinson. What the board required was, a large and consistent plan for an immense series of necessary improvements in the metropolis, accompanied by an estimate of their cost; and, with that view, he had much pleasure in supporting the motion of Mr. Wilkinson. This was a question which involved the outlay of millions, and he (the speaker) wished to see the matter so reduced to a plan, that, while avoiding extravagance in every way, it should be, when carried out, of the largest possible public convenience. Now, the committee to whom it was proposed to refer the question for consideration would, when they had matured plans, come up with certain recommendations, accompanied by an estimate of the probable expense; and then would be the time for his friend (Mr. Hawkes) to submit for the decision of the board whether, with the obligations laid upon them in reference to the sewerage of the metropolis, they were justified in taxing the ratepayers of the present generation to carry out these great improvements, or whether they should apply to Parliament for powers to spread the cost of them over a much larger period. Of course, it was a very easy matter to talk about making a rate, but it was not so easy a matter to collect one. The board were not, however, now obliged to deliberate upon this point; and he felt that there could be no two opinions about adopting this resolution.

Mr. WARE agreed with the last speaker as to the original motion, and strenuously objected to the proposed addition to it, as being contrary to the powers given to the board by the act of Parliament under which they acted.

Mr. HOWS would vote for both the motion and the amendment, believing that the board could not be better occupied than in providing facilities for promoting the health and recreation of the people. He had it on the authority of several eminent barristers that such improvements were within the province of the board.

Mr. CARPMAEL was of the same opinion as Mr. Ware, that, in order to carry out Mr. Turner's proposition, it would be necessary to go to Parliament for additional powers.

Mr. DOULTON, taking the same view of the case, and being opposed to any application for further powers at present, would vote against the amendment.

Mr. LESLIE said, if the board attempted too much at once, they would fail. The act of Parliament defined a specific work for the board. They had been constituted chiefly for the purpose of considering and carrying into effect the best means of cleansing the Thames; but already 5 per cent. of the time given them to execute that great work was nearly gone, and they had not yet got a plan before them of the way in which it was to be done. Every member of the board was bound to keep that subject steadily in view as the primary one which he was sent there to assist in carrying into execution; but in nominating committee after committee for this purpose and the other, they were only diverting their consideration from the great work which had been committed to their charge, and shirking the functions which devolved upon them in their collective capacity. He felt that they ought not to waste their time in the consideration of problematical improvements, when they had a great and well-defined one set before them, and a limited time in which to do it—namely, the complete purification of a magnificent river, which, if carried into effect, would immortalise them.

Mr. H. L. TAYLOR said, there was a general wish that this matter should be referred to a committee, and he would therefore vote for the motion, but against the amendment.

Mr. SEELEY, in supporting the motion, contended that, if the improvement of the metropolis had not been one of the functions contemplated by the Legislature, the old Commission of Sewers would never have been superseded.

The CHAIRMAN said, he wished the board clearly to understand the office and duty of the committee of works. If it were intended that that committee should originate questions, and entertain projects not specially referred to them by the board, it became a matter for grave deliberation whether a constitutional change would not be thereby involved. He apprehended that the board would feel bound to hold in its own hands the sole power to receive suggestions and plans for improvements and alterations in the metropolis, and that, when it thought advisable, it would refer these plans and suggestions to the committee for them to work out, and bring before the board again in such a tangible form that it could deal with them. He submitted, therefore, that it was in the highest degree necessary that a clear line of demarcation should be drawn between the functions of a committee of the board and those of the board itself. If this committee were to have the power of originating subjects of discussion, then, as he had said, a serious constitutional question would arise as to whether they were not trenching on the functions of the board itself. (Hear, hear.)

Mr. HALL said he understood their position to be this—that no person could go before the committee of works, except through the board; but there were some large questions which had already been considered in Parliament, and upon which reports had been published, and recommendations made, which it was desirable should be referred to them at once. Let the board recollect that at present they had only permissive powers to undertake improvements; and they could not take a single house without parliamentary sanction: and he would rather not extend the motion by accepting the suggestion of Mr. Turner. In fact, he would have preferred it with a restriction that the first work to be considered should be the improvement in Southwark, for which funds had already been provided. The effect of Mr. Leslie's recommendation would be, that the board ought to negative both motion and amendment; in other words, declare that, though they had appointed a committee, they would give them nothing to do. He thought Mr. Leslie, who had only sat at the board one week, was not justified in saying that 5 per cent. of the time allowed them for completing the sewerage of the metropolis was gone, without the board having done anything in the matter. (Hear, hear.) He (Mr. Hall) would have it go forth to the world that the very first step taken by the board was to initiate the work for which they were specially appointed. (Hear, hear.) They had unanimously referred it to their engineer to bring up a report upon the question of the great intercepting sewerage; and, until that report was before them, they could not go further. (Hear, hear.)

On the question being put,

Mr. LESLIE rose, and asked the chairman whether it was competent for him to take the vote on such a motion, which was, in effect, transferring the business of the board to a committee?

The CHAIRMAN said, it was quite competent for the board to refer any matter to a committee for them to examine and report upon.

The amendment was then put and negatived.

Mr. H. L. TAYLOR proposed another amendment or addition, in the following words:—"But that no plans or schemes whatever shall be entertained by the committee from individuals, unless referred by this board."

Mr. LESLIE: The chairman has just ruled that they cannot do so.

The CHAIRMAN said the honourable member for the City was, no doubt, quite right in suggesting such an addition; for, as the motion now stood, it gave the committee power to originate questions or to receive plans without a reference, which was highly objectionable, inasmuch as it interfered with the prerogatives of the board.

Mr. WILKINSON said he did not so understand it; but, after the remark of the chairman, he was quite agreeable to add the words.

Mr. LESLIE objected to the amendment, and contended that the original motion could not be put from the chair, as it was contrary to the statute.

The CHAIRMAN said he understood the suggestion of the honourable member (Mr. Taylor) to be an addition to the original motion; and, as there was no doubt the board could refer any matter to a committee they pleased, there could be no objection to it.

Mr. HALL said the 58th section of the act of Parliament gave the board power to appoint committees for any purposes which, in their discretion, they thought could be better regulated and managed by means of such committee.

Mr. NICHOLAY seconded Mr. Taylor's amendment.

Mr. CARPMAEL thought it would be better to add the words, "and that it be an instruction to the committee," &c. &c.

The amended resolution, with these words added, was then put and carried.

COMMITTEES.

Mr. WRIGHT moved, that Mr. Hall and Mr. Doulton cease to be members of the finance committee. He did so in conformity with an intimation given by him when nominating these gentlemen on the committee of works, and not out of any disrespect to either of them.

The motion not having been seconded, was lost.

On the motion of Mr. WRIGHT, it was agreed that Mr. Wilkinson be appointed to serve on the works' and improvement committee.

MINUTES OF THE BOARD.

Mr. DOULTON moved, "That the minutes of the proceedings of this board be printed, and circulated to every member at the same time as the business paper of the next meeting."

Mr. OFFOR seconded the motion.

Mr. WRIGHT thought it would interfere with a previous resolution, in which view he was confirmed by the chairman.

The consideration of the motion was therefore adjourned.

STATE OF THE EFFRA.

Mr. DOULTON moved, "That the state of the Effra, one of the main lines of sewer under the jurisdiction of this board, be referred to the works' committee for immediate inquiry and report as to the best means of remedying its present very dangerous and defective condition."

Mr. IRVINE seconded the motion, which was adopted.

A letter from Sir George Grey, approving of the bye-laws adopted at the the last board meeting, was then read.

Several reports from the engineer were read, and applications attended to.

TRAFFIC ON LONDON BRIDGE AND IN SOUTHWARK.

Mr. COLLINSON gave notice of his intention to renew his motion, at the next meeting of the board, with reference to the construction of a new thoroughfare in Southwark, to relieve the south side of the river and London Bridge of part of the enormous traffic occasioned of late years by the situation of the termini of the South-Eastern and South-Western Railways.

The board then adjourned.

MONDAY, MARCH 24.

This day a Special General Meeting of the Metropolitan Board of Works was held at the office in Greek Street—Mr. J. WILKINSON in the chair.

The meeting was convened for the purpose of hearing summonses against defaulters on the following district sewers' rates:—Ranelagh, Regent Street, Spitalfields, Poplar, and Blackwall, Limehouse, and Upper Limehouse.

THE COMMERCIAL GAS COMPANY.

This day was appointed for hearing the summonses issued against the Commercial Gas Company, to show cause why they refused to pay the sum of £410, charges upon them in respect of sewers' rates for their pipes and mains passing through the sewerage districts of Spitalfields, Poplar, and Blackwall, Limehouse, and Upper Limehouse.

Mr. JAQUES, secretary to the company, appeared in answer to the summonses.

Mr. WOOLRYCH, the clerk, said the Commercial Gas Company was now summoned for arrears of several rates charged upon them by different sewers' commissions in respect of their pipes and mains, but their collection had been deferred for various reasons. Recently, however, the board had come to a conclusion that there were no grounds for an exemption of the company, and in consequence the present summonses were issued.

The CHAIRMAN inquired of Mr. Jackson why the company objected to pay the rates?

Mr. JAQUES said they objected to the rate on the ground that their property was neither benefited, nor was injury avoided, by the sewers. Although their property was rated to the poor, which was the basis of the sewer rates, still he believed the Legislature never contemplated making them liable to sewer rates, as they were expressly prohibited from using the sewers, under a penalty of £200. On such grounds, he considered they were entitled to an exemption from the rate.

The CHAIRMAN: On what principle do you claim exception?

Mr. JAQUES said, on the principle that they were liable to a penalty of £200 a day if they used the sewers, and could not be benefited by them.

The CHAIRMAN said Mr. Jackson had not shown any legal exception, as the commissioners were called upon to levy sewer rates on all property rateable to the relief of the poor. The board sat there under the act that was existing

at the time the rates were made, and they had no power to travel out of the record.

Mr. JAQUES said the company had no objection to pay the rates on their premises, but when the rates were charged on their mains underground, they did think that was a point that was entitled to consideration.

The CHAIRMAN said they could not enter into the principle of benefit from sewers, or how far a particular property was benefited, as that would be everlasting.

Mr. JAQUES replied that, although no new sewer might be near a house, the surrounding property might be benefited, but their mains underground could not by any possibility be benefited. As they were prevented from using the sewers, they ought not to be rated for them. They had applied to former commissions, and hitherto no distress had ever been made on them. They neither derived benefit nor avoided injury.

Mr. TURNER wished to know what clause in the act they relied upon for exemption?

Mr. JAQUES said, they contended they were not liable on the principle of equity.

Mr. PASCALL remarked that, as the company were liable to the poor rate, they must be liable to the sewer rate.

The CHAIRMAN said, so far as the present case was before them, the company had no legal ground of exemption to allege, and it was the opinion of the board that the rate must be paid.

The rates were then ordered to be paid forthwith, or distress warrants would be issued for the recovery of the amount.

A conversation took place as to how far landlords were liable to sewer rates while their houses were unoccupied, and the question was deferred for further consideration.

FRIDAY, MARCH 28.

The board met this day at Guildhall, at twelve o'clock—Mr. THWAITES in the chair.

The minutes of the last board were read and approved.

Mr. CARPMAEL presented a memorial from the inhabitants of Clapham, complaining of the state of the Heath-wall Sewer, which it stated was a great nuisance to the neighbourhood, and, in the opinion of medical men, the cause of much illness. Mr. Carpmael said he had spoken to Mr. Bazalgette on the subject, who admitted that the sewer was in a very bad state, and required attention; but as it would be dealt with in that gentleman's forthcoming report on the drainage of the south side of the metropolis, he (the speaker) would, on the present occasion, simply ask the board to receive the memorial.

Memorial received accordingly.

BYE-LAW FOR REGULATING WIDTH OF STREETS.

The CLERK read the bye-law on this subject, and which had been approved by the Secretary of State.

It was moved, seconded, and carried, "That the said bye-law be, and is, hereby confirmed."

BYE-LAWS RESPECTING SEWERS.

The CLERK read the bye-laws on this subject made at a previous meeting, and which had been subsequently approved by the Secretary of State.

Mr. WILKINSON moved, that the said bye-laws be now confirmed.

Mr. CARPMAEL seconded the motion.

Mr. LESLIE said, on a former occasion he had asked the question whether the board had determined the principle upon which they would act as to the form of sewers, their mode of construction, and the materials of which they should be composed. It appeared to him that this was a most important matter, and would, if settled, save the board, as well as the several districts and parishes, a vast amount of trouble. Since he named the matter he had looked into the act of Parliament, which had confirmed him in the opinion that it was the duty of the board to make a bye-law to regulate these points. From those which were now brought up for confirmation, it appeared that the board had left it with the parishes and districts, who were only required to send up their plans and cross sections for approval. But he contended the act of Parliament directed this board to issue instructions for the guidance of the parishes on the subject. The 202nd section stated that the "Metropolitan Board may also from time to time make, alter, and repeal bye-laws for regulating the plans, level, width, surface, inclination, and the material of the pavement and roadway of new streets and roads, and the plans and level of sites for building, and for regulating the dimensions, form, and mode of construction; and the keeping, cleansing, and repairing of the pipes, drains, and other means of communicating with sewers, and the traps, and apparatus connected therewith." He therefore urged the board to put forward such regulations; and, where parishes and districts desired to deviate therefrom, to require from them plans showing the nature of such deviations, before granting permission to execute the works.

Mr. CARPMAEL said, if the honourable member had read the whole of the clause, he would have found that it had nothing to do with the question before the board. The bye-laws under consideration related to sewers with which the board alone had to deal.

The motion was then adopted.

STREET PROJECTIONS.

The CLERK read a report from the committee on the duties of the board under the Metropolis Building Act, containing various recommendations.

The report having been received,

Mr. MORELAND moved that the first recommendation be adopted. It was in effect, that the application of Mr. Ford, for leave to erect a building over the fore-court of the premises 22, White Conduit Street, Pentonville, be not granted. The honourable member said, the committee considered that the application involved a great principle, which the board ought not on any consideration to sacrifice. Only about one-fourth of the houses in the street had had their fore-courts built over, and the board ought not to sanction further encroachments.

Mr. CARPMAEL seconded the motion.

Mr. DENNIS said, unless the board were prepared to compensate parties whose houses had been injured by projections on either side of them, they ought not to interfere and prevent them from bringing out their frontages to the same level. He thought the question should be referred back to the committee for further inquiry.

Mr. T. H. HALL said, the board ought to ascertain, as early as possible, whether they had the power to prevent such encroachments or not. He believed they had, and therefore he urged them to affirm the recommendation of the committee, which would at once bring the question to an issue. It was not because improper encroachments had taken place under a former state of things, that therefore the board should perpetuate and extend the evil. He would ask, where was the matter to stop? To what height might parties be allowed to build? At present shop-floors only were projected: by and by, they would have buildings two stories high. It was matter of regret to see how many of the large open roads of the metropolis had been marred by such practices, and he believed the Legislature had wisely given powers to the board to put a stop to it for the future. If it should be found that their powers did not extend so far, the parties who considered themselves aggrieved by the acts of the board would contest the point, and it would then be for them to seek further jurisdiction in the matter.

Mr. PASCALL said he had viewed the premises, and believed it would be a great injury to the inhabitants of the locality generally if this encroachment was permitted. He believed it was in direct contravention of another act of Parliament, independently of the one under which the board was constituted. He regarded such projections as great nuisances, and referred to the annoyance arising from the smoke of the chimneys entering the upper windows of the surrounding premises.

Mr. NICHOLAY said he had no doubt the board had the power to stop these projections; but he thought they ought to be very careful how they exercised it. The parish authorities of St. Marylebone had been invested with somewhat similar power, and found that great discretion was requisite to use it aright. There were cases in which, through the change of fashion, houses which had formerly been private residences, with fore-courts or gardens, were much deteriorated in value, and converted by their owners into shops. This was the state of things in the Edgware Road; and a good deal of money having been spent in the alteration, the property rose in estimation, and the rateable value correspondingly increased. This remark would also apply to other parts of the metropolis. As to the remark of Mr. Pascall, of a nuisance arising from smoke, there were ample means for putting a stop to that. At the same time that he would urge the board to be very chary in the exercise of their powers, he would say, let every case be dealt with on its own merits; and, where the majority of the houses in a street have already erected projecting shops, do not inflict so great an injury upon the minority as to say they shall not bring their premises forward to the same level.

Mr. HOWS regarded the recommendation of the committee as a step in the right direction, and hoped it would have the effect of preventing the roads in the outskirts of London being further disfigured by ugly and irregular projections.

Mr. SAVAGE inquired whether the committee had viewed the premises in question.

The CHAIRMAN said, he believed the whole of the facts were before them when they made their report.

Mr. D'IFFANGER said, he was afraid, if the board interfered, and did not allow persons to bring out their shops, by which the houses were much increased in value, the property would by degrees get into the hands of a low class of tenants, who would fill the fore-courts with old furniture and other rubbish, and sadly spoil the appearance of the locality. This would be a serious injury to the parishes, whose rates would thereby be sensibly diminished. He referred to several cases in the New Road, where these projections had been allowed, and the property much improved.

Mr. MISKIN asked the board how they would deal with such cases as occurred in the Bermondsey New Road, for example, where the fore-courts were some thirty or forty feet deep. Would they say, that although the public thoroughfare in that road was 100 feet in width, they would not allow any projection beyond the fronts of the houses?

The CHAIRMAN said, he understood there were but three houses in the street under consideration which had been brought out.

Mr. H. L. TAYLOR said, there could be no doubt whatever but that the question before them was one of much importance. Parliament had left it with that board whether they would allow these projections or not; had it not been so, they would not have had the present application. He presumed the parties had come to ask the board to do something which they could not do without the power of the board. Under a former state of things they could and did do as they pleased in such matters, and the consequence was great irregularities in the lines of street frontages. The Metropolis Local Management Act gave power to the board to regulate such matters for the future, and the 143rd section of that act specially referred to it. By that section it appeared that, if a house stood back from the public road 30 feet and upwards, the parties owning the property could build a projection up to that distance, but in all other cases must obtain the consent in writing of the board. It was very important that the board should take cognisance of these matters, and deal with them upon their merits. There might be cases in which three-fourths of the houses in a street had been already brought out, and in which, for the sake of uniformity, it was desirable the others should be permitted to erect shops in front; but in such an instance as the present, where, as the chairman had told them, there were only three, it ought to be refused. Instead of offering compensation to the parties whose shops were not brought out, they ought rather to make arrangements with those who had done so, and grant compensation to them to take down the buildings, so as to open the street again to the public. It was for them to compensate those who brought out their fronts before the new act passed, and not to encourage those who might wish to do so at the present time.

Mr. IRVINE said, they had the whole matter before them in committee, and the recommendation they had made seemed the only one they could adopt.

Deputy HARRISON said, the board had that morning confirmed a standing order which stated that "every new street within the limits of the metropolis, as defined by the said act, must be of the width of 40 feet at least." If they permitted this person to encroach, they must allow other parties to encroach also; and this would reduce the street to 39 feet 6 inches. Forty feet was the proper width, and if they allowed the application, they would be violating this principle. It was their duty to put in force the provisions which had been found necessary to stop nuisances occasioned under the operations of a former act.

The recommendation of the committee was adopted, with two dissentients.

Mr. MORLAND moved the second recommendation, which was, that the application of Mr. Samuel Fox, for permission to erect buildings over the fore-courts of the premises 79 and 80, Chapel Street, Pentonville, be not granted. In doing so, he said that out of 230 houses in the street, not one quarter of them had projecting shop fronts; and the district surveyor agreed with the committee that it would be better not to sanction any more. These projections in front of dwelling-houses, which were frequently let off apart from the shops, were exceedingly dangerous in case of fire.

Mr. CARPMAEL seconded the recommendation.

Mr. DENNIS objected to the motion, and thought the matter should be reconsidered, as the projections now asked for would only bring the fronts of the shops into a line with those at either end of the street. If the board were inflexible in the application of their rule, to require that every street should be not less than 40 feet wide, they would find that builders would be little disposed to give them more, however desirable in some cases it might be.

The recommendation was adopted.

The next was, that the application of Mr. Hemming, for the sanction of the board to the erection of the temporary building constructed by him for a workshop, on ground adjacent to the North London Railway, near Fairfield Road, be granted, upon his producing the consent of the railway company in writing to its remaining in its present position, and forming the gables of such building with brick noggin, covered with corrugated iron or other metal.

The CHAIRMAN ruled, that without notice of motion this could not be entertained, as the board had already adopted a resolution on the subject.

The question was therefore adjourned.

The fourth and fifth recommendations were adopted; the latter with some emendations. They are as follows:—"That certain forms submitted to the committee by the superintending architect be the forms in which the district surveyors, under the Metropolitan Building Act, 1855, shall make their returns to the board, pursuant to the 52nd section of that act. That lists of the district surveyors under the Building Act, with their official and private residences, the hours of business, and the districts they are employed in, be printed for the use of the several vestries and district boards, and the public."

FINANCE.

A report from the committee of finance was read. It contained recommendations to the following effect:—"That the salaries of the officers employed under the late Metropolitan Commissioners of Sewers, and reappointed by this board; and also those of the officers formerly employed in the Metropolitan Buildings' Office, and now employed in the service of this board, be paid for the whole period between the 1st of January and the 25th of March. That the sums specified in the statement submitted to the committee, amounting in the whole to £26,296. 18s. 7d., be paid. That the sum of £7554. 15s. 9d., being a portion of the moneys of the board at the Bank of England, be withdrawn, and placed to the current account of the board at the Bank of London. That new contracts for the stationery and printing required by the board be entered into; that the stationery and printing be the subject of distinct contracts; and that such contracts be entered into for one year. That nine stationers be invited to send in tenders for the supply of stationery to the board. That eleven printers be invited to tender for the printing of the board. That the accounts of the board be kept under the three distinct heads of sewerage and drainage works, metropolis improvement works, and main intercepting drainage works.—That the recommendation of Mr. Donaldson, as to the apportionment between the board and the contractor, Mr. R. Goodison, of the amount of compensation awarded to Messrs. Sheppard, and costs, be approved; and that the sum of £297. 2s. 6d. be paid to the contractor, in accordance therewith."

Mr. DALTON moved the adoption of the report, which having been seconded,

Mr. LESLIE said that, in looking over the report, to which he did not object as a whole, except that it did not go far enough, he was not a little surprised that no mention had been made of the housekeeper, who, since the dissolution of the late Board of Sewers, had been compelled to keep two servants, and to involve herself in a number of expenses, in order to keep up the establishment in Greek Street as heretofore. He thought Mrs. Pollard, the housekeeper, ought to have been named for compensation.

The CHAIRMAN said, no doubt the housekeeper was entitled to some remuneration, and her case was not overlooked; but it would have been irregular to introduce it into this report.

Mr. H. L. TAYLOR stated that he was much surprised both at the report and the observations of Mr. Leslie. They were actually about to pay officers for doing nothing; and if those gentlemen acted a manly part, they would refuse to accept it. And whose money was it they proposed to spend? why, that of the poor ratepayers, who could hardly manage to meet the claims thus made upon them. It was doing more than an act of justice to their clerks, and a gross injustice to the ratepayers.

Mr. DOULTON said the parties whom it was proposed in the recommendation to pay salaries to would be, if the motion was rejected, entitled to compensation. Many of them were engaged, although not actually appointed by the board, in carrying out works commenced under the late commission; and, from what he (Mr. Doulton) had seen, they contributed material help in the preliminary stages of the board's operations.

Mr. SAVAGE supported the recommendation.

Mr. T. H. HALL thought his friend Mr. Taylor was mistaken in his view of the subject. He (Mr. Hall) looked upon the proposition as one of bare justice, and therefore he would support the committee. Mr. Taylor was very jealous upon all occasions of extravagant expenditure, and such men were useful. He (Mr. Hall) had frequently had the pleasure of differing with Mr. Taylor upon such subjects, and he was gratified in doing so upon that occasion.

Mr. NICHOLAY said that, though always desirous to save the pockets of the ratepayers, he thought it was a false economy to underpay those who did the public service.

Mr. CRELLIN reminded the board that, on a former occasion, the chairman had stated that these gentlemen were engaged till twelve o'clock at night in the fulfilment of their duties.

This recommendation of the committee was then put and carried.

The CHAIRMAN intimated that he had that morning attended at the Bank of England, and transferred the sum of £139,500, which originally stood in the names of five or six gentlemen, members of the late Commission of Sewers, into the names of the gentlemen appointed trustees for the board.

The second, third, and fourth recommendations were then agreed to.

The fifth and sixth recommendations, relating to contracts for stationery and printing required by the board, gave rise to a long conversation—an opinion being expressed by several members that the contracts ought to be thrown open to public competition. The majority of the board, however, were, upon the votes being taken, in favour of the conclusion arrived at by the committee, and the recommendations were substantially adopted—the only exception being that, in the case of the printing, the names of fifteen firms were inserted.

The remaining recommendations were agreed to.

APPOINTMENT OF HOUSEKEEPER.

Mr. George Edward Boggis was unanimously appointed housekeeper at the Greek Street offices of the board—an inspection of the register of his birth having proved that he was within the prescribed age.

BYE-LAWS FOR REGULATING PROCEEDINGS.

Mr. DOULTON brought forward a proposal having for its object the arrangement of the business of the board, so as to receive the reports of officers and applications from districts, vestries, and individuals, before discussions on motions of which notice had been given.

After some observations from Deputy HARRISON and the CHAIRMAN, the honourable members consented to postpone the subject until the report of the bye-laws' committee could be discussed in a committee of the whole board.

PRESENTATION OF MEMORIALS, &c.

Mr. DOULTON then moved, "That every deputation do forward to the chairman of the board, in sufficient time for insertion in the business paper, an abstract of the subject on which it is proposed to address the board; that such abstract be printed and circulated to the several members, with the business paper, for the meeting preceding that at which the deputation requires to be received; and that no deputation be heard, unless the board shall have agreed thereto by a specific resolution." He pointed out the great inconvenience and hindrance to public business which was likely to arise from the course hitherto permitted by the board, of allowing deputations to attend in order to urge the consideration of questions which, though of interest to the parties locally concerned, were not of general utility, or of such a nature as to come within the province of the board.

Mr. BURSLEM seconded the motion as he would do any proposition having for its object to put a stop to the threatened inundation of memorials on subjects which the board had not the funds to deal with.

Deputy HARRISON said, there would not be much difference of opinion as to the spirit of the motion; but he thought the terms might be amended. Speaking from experience in the business of the corporation, he recommended the adoption of a resolution to this effect:—"That notice be given in writing, at the office of the clerk of the board, of all petitions or memorials intended to be presented to the board, at least three clear days before their presentment; and that notice of the subject of such petition or memorial be printed on the summons of the court. That no petitioner or memorialist be permitted to address the board." Of course this would not prevent an answer being given to any question which might be proposed.

Mr. DOULTON accepted the proposition of Deputy Harrison, and the same was referred to the bye-laws' committee to incorporate in their report.

THE GREAT INTERCEPING SEWERAGE SCHEME.

The CHAIRMAN then said: Gentlemen, I hope that this day week our engineer will be prepared to lay before you his plans for the main drainage of the south side of the metropolis, and that this day three weeks he will be prepared with his plans for the northern drainage. (Cheers.)

CLAIMS FOR COMPENSATION.

Mr. CRELLIN moved, "That it be an instruction to the committee on claims for compensation, that in every case of compensation applied for by officers of boards which have had jurisdiction in more than one parish or district, to give information of such application to each vestry and district board to which such jurisdiction extended."

Mr. R. TAYLOR seconded the motion.

The motion was agreed to.

On the proposition of Mr. SEELEY, the vacancy in the committee on the site of offices, in consequence of Mr. Hunt's resignation, was filled up by the appointment of Mr. Snow.

IMPROVEMENT IN SOUTHWARK.

The CLERK read the following letter addressed to him by direction of Sir B. Hall, in answer to his communication on this subject:—

Office of Works, March 12, 1856.

Sir,—I am directed by the Chief Commissioner of her Majesty's Works, &c., to acknowledge the receipt of your letter of the 8th instant, requesting, by direction of a committee of the Metropolitan Board of Works, information as to certain funds provided by Parliament for effecting improvements in Southwark, and to acquaint you, in reply, that upon the passing of the act 16 Vic., c. 18, the two sums of £30,000 and £30,000, respectively directed to be raised, as stated in your letter, by the acts 4 Vic., c. 12 and 13, and 14 Vic., c. 103, together with interest, as provided by those acts, were advanced to this board from the Consolidated Fund; that the money, with the interest which has since accrued, was invested in the purchase of Exchequer bills to the amount of £83,900, which will be shortly increased by a further receipt for interest of about £2000.

The object for which this fund was raised appears, by the act of Parliament above mentioned, to be the making a continuous line of street between Southwark and Westminster Bridges, through Stamford Street and the York Road, by which a ready means of communication between the termini of the Brighton and Kent railroads at London Bridge, and the whole of the west end of the metropolis, would be provided.

No authority, however, was given to this board to enter upon the undertaking, and they are only to apply the money received under the authority of some act or acts to be passed for that purpose within seven years from the date of the act 16 Vic., c. 18 (May 9, 1853); and in case the money shall not be so applied within that period, then it is provided that it shall be repaid to the Consolidated Fund.

I am, Sir, your most obedient servant,

(Signed) ALFRED AUSTIN, Secretary.

Mr. COLLINSON then moved, "That it be an instruction to the committee of works that the first public improvements it shall consider be for the formation of a line of street from the High Street, Southwark, towards Waterloo Road, especially considering that there is a sum of £80,000 already provided in aid of that object." He said that at the time his preceding notice of motion was given, there had been no preparations made to entertain a question such as that, but since that time the board had established some degree of machinery for that purpose. Having also been encouraged by the support of many of his colleagues, and having had the assurance of their voets, he again brought it before the board. It was a matter of considerable importance, and might occupy a lengthened period in its execution; but he had now some hopes of carrying a resolution of that kind. It was a matter he felt to be of so much urgency, that it should be taken at once.

Mr. TURNER rose to order. By a resolution of the last board meeting, the committee of works were directed to consider some comprehensive scheme for the general improvement of the metropolis. The motion now submitted to them seemed to be at variance with that resolution.

The CHAIRMAN said, it was quite competent to the board to pass a resolution giving instructions to a committee upon any matter they might have under consideration, and this was one of them.

Mr. COLLINSON proceeded to point out the great necessity for this improvement. It was to remedy an evil, not of yesterday's growth, but of some twenty year's complaint. He found, by a reference to the books furnished by the courtesy of the chairman, that so far back as 1840 plans were submitted to the Goverment from two different sources, for improving the traffic accommodation of the locality; and since that period the attention of eminent men had been directed to the same subject. These plans had never been entertained for want of means; but now they found that the sum of £83,000 had accumulated for that purpose, and must be expended before 1860, or else it would return to whence it came. With regard to any plan to be submitted to the committee, he would say that he had no definite plan, but he hoped to bring before them the plans which had been submitted to the Government, and had met with their approval. There was, therefore, ample material to go before the committee. It had been said, that before the board took the subject into consideration, they ought to have before them some grand scheme, which should embrace the whole of the metropolis, but he apprehended that the motion of which he had given notice need not interfere with any metropolitan improvement, for he thought they were in a position different from any other part. He did not know that for any other part there were funds in hand. He hoped the board would be disposed to lend their concurrence, and he believed that he should have the concurrence of all the gentlemen who represented parishes on the same side of the water as he was; and therefore he begged leave to move that the committee be instructed on the terms of the motion he had read at the commencement of his observations.

Mr. CHARLES HARRIS seconded the motion.

Mr. R. TAYLOR supported the motion. Since the matter came before the court, on a previous occasion, he had examined the act of Parliament under which the £80,000 had been set aside, and he found that he was in error in reference to its application to the borough of Lambeth. Having no right to it himself, and seeing it was to be used on the south side of London within seven years from 1853, or to be paid back again into the Consolidated Fund, and looking at the various claims of the neighbourhood, he would support

the outlay; for, should it get again into the Consolidated Fund, when should they be able to get it back again? They had been told to wait until some important scheme took place. He did not know what scheme was alluded to. There was the "important scheme" of Sir Joseph Paxton; but when they came to discuss that scheme, there would doubtless be a great deal for it and a great deal against it. There was also a scheme of Mr. Charles Pearson's, which it might be the case that that board would, some time or other, have to take up. There was a great necessity that something should be done, for at the present time, in going over London Bridge in a cab or a carriage, it was ten chances to one but the vehicle would get blocked in, and they would get to the entrance to the station just in time to hear the railway whistle, and their wives and sons, with themselves, would be left behind; whereas, if there was a wide street, all the inconvenience and annoyance would be avoided. Of all improvements that had been suggested, there was none so important as that which their friend had brought before them, and he would, therefore, most cordially support the motion.

Mr. CARPMAEL suggested that, as this question was not definitely before the committee of works, it would be well to frame the motion so as to embrace a reference; and he would advise the following in substitution of the motion of Mr. Collinson:—"That the memorial from Southwark respecting street improvement in Southwark, together with the report of the finance committee, read this day in relation thereto, be referred to the committee of works and improvements."

Mr. CORRIE expressed his approval of this amended form of motion.

Mr. T. H. HALL had no doubt Mr. Collinson would accept it in lieu of his own. He heartily approved of the step proposed to be taken; and, as the fund in hand would receive accessions in the shape of interest before it was required to be used, and would be almost sufficient to meet the ultimate loss in effecting the improvement, it would involve the necessity of only a slight taxation to carry it out.

Mr. COLLINSON expressed his willingness to accept Mr. Carpmael's form of motion.

Mr. LESLIE inquired what the probable cost would be?

Mr. CORRIE: We cannot tell. It will be for the committee to ascertain and report.

Mr. LESLIE said, on the surface it was a very great improvement, capable of being effected in a very easy manner. The probable cost, he thought, might be ascertained by writing to the Chief Commissioner of Works, who had the estimates for the plans laid before Government.

The CHAIRMAN: Your object, then, would be accomplished if the resolution is adopted. It will be a reference of the memorial, which will raise the whole question.

Mr. LESLIE: Then the board has no plan for it at all?

Mr. T. H. HALL: No; and none can be agreed to till it comes before this board for their sanction.

Mr. BIDGOOD said, that as a West-end man, he took an interest in every metropolitan improvement, and was rejoiced to see that the board had already begun to take a step in what he thought was almost the only direction in which the public were just now looking to the board for. He was glad, too, of the opportunity of saying that he entirely disagreed with the doctrine laid down by Mr. Leslie, that they ought to defer all questions of metropolitan improvements till the intercepting sewerage was completed.

Mr. LESLIE said that was not his doctrine.

Mr. BIDGOOD was rejoiced to hear it, and hoped the honourable member would give proof of it by rendering help in this important matter.

Mr. LESLIE explained that, by his remarks at a former meeting, he simply meant to affirm that they should first attend to works the execution of which was imperative, and the time for whose completion was limited.

Mr. HAWKES agreed with the object of the motion, but thought the board ought first to determine in what mode the funds for these improvements should be raised.

Mr. T. H. HALL said the board could not undertake them without the sanction of Parliament; and, if they obtained that, they would at the same time obtain power to raise the money.

Mr. SEELEY said that he intended to put a notice of motion before the board, which would raise the question suggested by Mr. Hawkes. It was as follows:—"That, in order to make provision for the proper carrying into effect the 144th clause of the Metropolis Local Management Act, it be referred to the finance committee to prepare and lay before this board an estimate of the several sums which it will be necessary yearly to assess upon every parish or district in this metropolis, in order to realise a stated income of £100,000 per annum, to be applied to the purposes described in the said 144th clause; and also an estimate of the rate which will be required to raise such sum, supposing that the whole metropolis be rated in one and the same proportion."

The motion of Mr. Collinson was then put and agreed to.

On the motion of Mr. HAWKES, seconded by Mr. DIXON, the name of Mr. Leslie was substituted for that of Mr. Hunt, on the appeals and building act committees.

Mr. OTTOR moved, "That the award of the Hackney district board, for compensating Mr. Thomas Woodward for loss of office as assistant-surveyor of highways, be confirmed by the board."

Some discussion ensued hereon, and it was ultimately agreed to postpone the subject till notice was sent to the parish of the application.

Reports from the superintending architect were read and agreed to.

The CLERK read a resolution of the vestry in support of the proposal submitted last week by Sir E. Belcher, for making a foot-way from Brompton Square to Ennismore Gardens.

Mr. HAWKES gave notice of motion to refer the whole question to the works' committee.

The CLERK read a report from Mr. Bazalgette, recommending that permission be given to the Chelsea Water Company to carry pipes across the Ranelagh sewer at Knightsbridge, which was agreed to.

Mr. D'IFFANGER gave notice of the following motion: "That, in order to ascertain how far it may be desirable to carry out that portion of section 141 which empowers the board, 'where more than one street in the metropolis is called by the same name, to alter the name of any and all such streets, except one,' a letter be addressed to all the vestries and district boards, requesting them to furnish this board with an alphabetical list of all their streets, &c. That the consideration of this subject be referred to the committee appointed to confer with vestries and district boards."

The board then adjourned.

SCIENCE APPLIED TO GAS-FITTING.

By ALEXANDER WRIGHT, ESQ.

(*Being the substance of a Lecture delivered Feb.* 14, *at the St. Martin's School-Rooms, St. Martin's Lane, at the request of the Gas-Fitters' Institution.*)

Dr. BACHHOFFNER, the president, in the chair.

I have, upon many occasions, heard complaints from consumers of gas of the manner in which gas-fittings are executed in the metropolis. It is not for me to decide whether these complaints are just or not, nor whether, supposing them to be well grounded, they are the result of competition and reduced price, or of want of skill in the workmen. One matter we will all agree upon, and that is, that no art is so well practised but that, by mutual interchange of ideas among those who practise it, some improvements may arise.

In the observations I have to address to you to-night, I do not intend to dwell upon that part of your business with which a long apprenticeship has made you familiar, but rather to bring before you some matters which the sciences applicable to it would suggest.

The business of the gas-fitter begins where that of gas-manufacturer terminates. It is the province of the gas-manufacturer to deliver gas at the door of the consumer of *good illuminating power, free from impurities*, and with *sufficient pressure*. The gas-fitter is required to lead the gas from thence to the burners in a satisfactory manner.

When complaints of insufficient lighting arise, it is no unfrequent occurrence to find the blame shifted about from one party to the other; it is, therefore, necessary that the duties of each should be defined.

The first two duties of the gas-manufacturer are agreed upon by all parties concerned.

Gas of good illuminating power means, that the light of 12 spermaceti candles may be obtained from a consumption of 5 feet per hour when ordinary gas is used, and from 1½ to 2 times this light from cannel gas. Variations from time to time, above or below the standard, are equally inconvenient.

Practically speaking, gas is pure when it is free from sulphuretted hydrogen, and moderately free from ammonia. Sulphuretted hydrogen, while in combination with the gas, acts corrosively upon the metal of the fittings; and, after combustion, tarnishes gilding, and is injurious to health. Ammonia is only so far injurious as it acts upon the metal of the pipes previous to combustion.

What is sufficient pressure has not yet been publicly discussed; some engineers assume one minimum, and some another. I will assume that 8/10ths of an inch is the lowest satisfactory pressure which an engineer should give outside the premises of the consumer, and, where cannel gas is used, 10/10ths.

These requisites being complied with, we may proceed to the examination of the duties of the gas-fitter; and I will take them under three heads:—

1. Leakage.
2. Choice of metal for fittings.
3. Size of pipes.

1. LEAKAGE.

That gas-fittings should be sound, for the sake of economy, there can be no question—and also because the slightest smell of gas is objectionable to persons not (like you) accustomed to it; but, above all, from the danger to life and property from fires or explosions. Fortunately, these are not of frequent occurrence, notwithstanding the liberal use of gas in the metropolis; still, one such accident prevents numbers of persons from becoming consumers.

Gas in itself is not explosive: it is only so when mixed with air. 1 volume of gas to 8 volumes of air is the most explosive mixture; 1 of gas to 4 of air is not safe; 1 of gas to 14 of air is not safe; and all mixtures of between 4 and 14 parts are more or less dangerous.

It is, however, possible, and even highly probable, that explosions have taken place where only *one* per cent. of gas was present.

Take the instance of a close apartment, and suppose gas to have escaped into it, enough to occupy a hundredth of the space; gas, being lighter than air, at once takes its place next to the ceiling; the law of the diffusion of gases then begins to operate, and in a given time about one foot of space from the ceiling will be filled with the most explosive mixtures, while the under part of the room has scarcely any gas in it.

Where an escape of gas occurs, enter the apartment *without a light*, open the top of the window and the door, and, before introducing a light, take some means to ascertain—as by smelling near the ceiling—that the gas has all gone. If a light is in the apartment, extinguish it, or lower it to the floor: to lift it near the ceiling is highly dangerous.

Accidents have taken place from the use of water slide-pendants, where the seal is not long enough, or from the evaporation of the water; and I cannot but regret that a suggestion of my friend, Mr. Cowan, now the engineer of the Oriental Gas Company, has not received more attention, viz., that of making the reservoir at the top larger, and partially covered, to prevent and compensate for evaporation as much as possible.

[The lecturer here filled a glass with gas, and mixed it with air, and caused an explosion by igniting it.]

2. CHOICE OF METAL FOR FITTINGS.

There was a time when the tubes used for gas-fittings were generally inferior in quality. Improvements in manufacture have now left little to be desired in this respect, where respectable firms are dealt with.

I give the preference to iron fittings, both for strength and durability. Iron is less acted upon by gas than any other commercial metal, and its decay seems only to result from the action of air and moisture, and takes place more on the outside than on the inside.

The next best style of fittings, in my opinion, is that adopted at Liverpool, and generally throughout the Continent, where pure lead pipes are used, without union joints, each pipe being soldered directly to the other.

It is of great importance in gas-fitting to avoid connecting one kind of metal with another, such as brass and lead, or brass and tin; a galvanic action being induced by this means, whereby one of the metals is rapidly corroded. In these cases the brass always decays first. This you must have observed in examining old fittings.

What is termed the nose-pieces in tin or lead fittings must necessarily be of hard metal; and I may mention that copper has been successfully used for this part.

Where lead pipes are used, it has been found desirable to lay the horizontal pipes on wooden laths grooved on purpose, otherwise they would fall into curves, where a lodgment of water would interrupt the flow of gas.

Tin pipes are superior to lead in this respect, being stiff enough to sus-

tain their own weight when properly hooked up, but in no other that I know of.

Composition pipe, which I suppose (not having analysed it) to be a mixture of lead and antimony, is now frequently used. It is made to imitate tin in stiffness; but, as it is generally fitted with brass unions, I do not think it so good as lead jointed without unions.

3. Size of Pipes.—Pressure.

There is no branch of your business which is so little understood, even by scientific men; and certainly none which gives rise to so many disputes and dissatisfactions, as that relating to the size of pipes necessary to give sufficient supply; and it is to this part of our subject that I wish specially to call your attention.

Insufficient pressure may be either the fault of the gas company or of the gas-fitter, and some determinate data should be laid down to decide when the one is in fault and when the other.

The questions then to be discussed are—

1. What is a sufficient pressure from the gas company at the door of the consumer?

2. How much pressure should be absorbed by the fitter in transmitting the gas to the burners?

3. What is sufficient pressure at the burners?

My experience would suggest the following as the pressure required at the burners:—

Common Gas.		Cannel Gas.	
Argand	3/10ths	Argand	4/10ths
Batwing	3/10ths	Batwing	5/10ths
Fishtail	4/10ths	Fishtail	6/10ths

These pressures are to be taken by a gauge attached to the burner-socket, when the full quantity is being consumed.

I conceive that 4/10ths may be fairly put at the disposal of the fitter for the friction of meter, pipes, and brass fittings. This, added to the pressure required at the burners, will give 8/10ths for common gas, and 10/10ths for cannel gas, as the minimum pressure to be supplied by the gas company.

You are aware that it is impossible to give the same pressure in all parts of a district. Excess of pressure is not generally an inconvenience to you, and my observations now apply to the least pressure which a gas company should give at any point.

You have, no doubt, observed that the pressure of gas is always greater in the upper floors of a house than in the lower ones. This arises from the difference of specific gravity of air and gas.

As a practical rule, you may take it that, if a gas-pipe ascends 12 feet, 1/10th will be added to the pressure, and the same will be deducted if it descends 12 feet. This applies to common gas. The same effect is produced with cannel gas by every 14 feet of elevation, the difference between the specific gravities being less in the latter.

The formula for determining this at slight elevations from the earth may be put in the following shape:—

Supposing—

a = weight in lbs. of 1 cubic foot of air.
g = " " " gas.
d = difference.
w = weight of cubic foot of water.

$\frac{d}{w}$ = height of column of water

expressed in feet, caused by every one foot of elevation of a column of gas.

Thus:—

Common Gas—Specific Gravity ·400

a = ·075 lbs.
g = ·030 "
d = ·045 lbs.
w = 62·3 "

$\frac{·045}{62·5}$ = ·00072 feet = ·0086 inches = ·086 tenths of an inch per foot elevation.

Cannel Gas—Specific Gravity ·500

a = ·075 lbs.
g = ·0375 "
d = ·0375 lbs.
w = 62·3 "

$\frac{·0375}{62·5}$ = ·0006 feet = ·0072 inches ·07 tenths of an inch per foot elevation.

I have stated that cannel gas requires more pressure at the burner than common gas. The reason of this is, that it requires more oxygen for combustion, and should be projected into the air in a thinner stream and with greater force.

We now come to the consideration of loss of pressure through the fittings, which has been assumed 4/10.

You are aware that it is necessary to allow a certain amount of pressure for the propulsion of the meter, where one is used. This I put down at 2/10 in. It is true that, when a meter is new, it will deliver its registered quantity at a little over one-tenth; still it is fair to allow something for age and deposits.

It will also be found that the bracket, pendant or chandelier will generally absorb 1/10. There is, therefore, left 1/10 for the friction of the pipes.

As a rule, I believe it would be well to lay pipes of such a size that not more than one-tenth of an inch pressure would be absorbed between the meter and the brass fittings.

To show the effect of friction, the lecturer here placed on the table a coil of tin pipe (usually termed 3/8, but absolutely ½ in. in the bore), 50 feet long; and, by passing about 7 feet per hour through it, showed a difference of 1 inch on the gauges placed at either end of it.

I stated at a previous part of the evening that scientific men were not well informed upon this matter. If they were, and any formula were in existence which could be relied on, it would be easy for me to calculate a table of lengths and diameters of distributing pipes to be used for particular quantities of gas, which might be a rule to guide you in your operations.

The formula which is now mostly relied upon by gas-men is that given by Mr. Pole, in the Journal of Gas Lighting (page 352, Vol. ii.). This I have found applicable to large mains; but it does not give a result at all near the truth in the small fittings used by you.

The following results have been obtained by actual experiment upon tubes of the sizes generally used by gas-fitters—those on ¼-inch, 1-inch, and 2-inch pipe by myself, and those on the ¾ pipe by Alfred King, Esq., of Liverpool, by whose kindness I am enabled to lay them before you. When allowances are made for the use of air in the one case, and gas of ·5 specific gravity in the other, it will be found that there is a general agreement in the results.

Table of Experiments

On the Discharge per Hour, in Cubic Feet, of Gas of the Specific Gravity of ·500, through a Pipe 2 Inches internal Diameter, at various Pressures.

Length of Pipe.	1/10	2/10	1/4	3/10	4/10	5/10	6/10	8/10	1 in.	15/10	16/10	18/10	2 in.	25/10	28/10	3 in.	35/10
100 feet 6 inches	...	...	...	...	780·	...	...	...	...	...	1900·	...	...	...	2580·	...	...
12 " 1 "	...	...	...	...	2700·	...	...	3600·	...	...	...	...	...	...	...	...	...
Experiments on a pipe 1 inch internal diameter.																	
100 feet	...	...	...	...	150·	...	...	...	...	...	330·	...	...	...	400·	...	...
50 "	...	...	...	...	200·	...	...	...	...	...	480·	...	...	...	...	...	...
Experiment through an orifice of 1 inch diameter.																	
	...	...	...	...	1041·	...	...	...	...	...	...	...	...	...	...	...	...
Experiment on a pipe ¼-inch internal diameter.																	
50 feet	·8	...	1·7	...	...	3·6	...	...	7·	...	...	11·	...	...	...	...	...
25 "	1·2	...	2·5	...	...	5·5	...	...	10·8	...	...	...	...	...	...	...	...
14 " 3 inches	...	4·5	...	...	7·45	...	...	13·3	...	...	...	...	...	...	...	...	...
8 " 5 "	2·2	...	...	7·7	...	...	20·	...	...	...	...	...	...	...	...	...	...
Experiments by Alfred King, Esq., in the year 1836, on the discharge of air through a pipe ¾-inch internal diameter.																	
613 feet, with 12 bends	...	...	...	...	...	1·05	...	...	2·10	3·20	...	...	4·20	5·22	...	5·88	...
460 " " 8 "	...	...	...	...	...	1·38	...	...	2·74	4·07	...	...	5·40	6·51	...	7·59	8·70
307 " " 6 "	...	...	...	...	...	2·10	...	...	4·07	5·94	...	...	7·69	9·51	...	11·07	12·61
153 feet 3 in., with 4 bends	...	...	...	...	...	3·70	...	...	7·26	10·44	...	...	13·24	15·84	...	18·30	20·61
100 " with 4 bends	...	...	...	...	...	5·94	...	...	10·98	15·36	...	...	19·40	23·10	...	...	...
98 feet, in a coil 18 in. interl. diam.	...	...	...	...	...	4·56	...	...	8·04	11·10	...	...	13·68	16·20	...	18·60	...
75 " no bends	...	...	...	...	...	7·82	...	...	13·92	...	...	...	25·32	...	...	31·92	...
50 " "	...	...	...	...	...	10·44	...	...	19·56	27·00	...	...	31·62	34·02	...	36·90	...
40 " "	...	...	...	...	...	13·44	...	...	24·84	31·02	...	...	34·02	37·80	...	41·52	...
30 " "	...	...	...	...	...	16·80	...	...	29·52	33·60	...	...	38·40	43·50	...	48·00	...
25 " "	...	...	...	...	...	...	...	...	...	36·30	...	...	42·18	47·76	...	52·62	...
5 " 7½ in., with no bends	...	...	...	...	...	47·22	...	...	69·90	87·30	...	...	...	...	...	...	...
Experiment through an orifice in a tin plate, ¾-inch diameter.																	
	...	...	...	...	...	...	...	...	124·8	150·6	...	...	...	...	...	...	...

It would appear from these, that (although in large pipes the deliveries are nearly as the areas), when the diameter of a pipe ranges between 2-inch and ¼-inch, this rule does not hold good. The ratios are as follow:—

The area of a 1-inch pipe is 1/4th of a 2-inch pipe; but practically it requires about six 1-inch pipes to deliver an equal quantity.

The area of a ¾ pipe is about 1/8th of a 1-inch pipe, but it requires fifteen ¾ pipes to deliver an equal quantity.

The area of ¼-inch pipe is 1/16th of a 1-inch pipe, but it requires sixty ¼-inch pipes to deliver an equal quantity.

It also seems to hold, as a general rule, that if the length of a pipe is doubled, it requires double the pressure to deliver the same quantity. Length and pressures are, therefore, reciprocals to each other. But it does not seem to hold good, as has been generally assumed, that the deliveries of gas are as the square root of the heads of water, except in simple orifices or comparatively short lengths of pipe.

Nor does it seem to hold good, as has also been assumed, that the deliveries are inversely as the square root of the lengths of the pipes.

The shorter the pipe is, the nearer it conforms to this law. Above 3000 diameters, the deliveries seem to be inversely as the lengths.

When those experiments have been confirmed by others, tables may be calculated for the guidance of practical men; meantime, the use of long pipes, of 1/4th or 3/8ths diameter should be avoided, even where one light has to be supplied, and some approximation may be made to the lengths of other sizes of pipes where particular quantities are required.

THE SOUTH LONDON GAS CONSUMERS.—A deputation from the South London Gas Protection Society waited, on the 19th ult., upon the directors of the South Metropolitan Gas Company, to urge on them the propriety of reducing the price of gas. Mr. Evans and other members of the deputation represented the case, stating that the reduced price of coal ought in fairness to be accompanied by a reduction in the price of gas. Mr. Simpson, the deputy-chairman of the company, said, the directors had always been anxious to give the consumers every advantage they could afford; but he must tell the deputation that their argument was based upon unsound opinions. Coals not only are not lower at the present time, but considerably higher. When the directors raised the price of gas in 1854, they took as their basis the price of coals in 1852 and 1853. Since that, they had been giving, in the last year, equal to 53 per cent. on that price for a continuance. The same was true with regard to iron, the price of which had so much advanced that, as compared with 1852, the company had been paying nearly 40 per cent. more for iron. Another important item was that of fire-bricks, for which there was a large outlay, and in the cost of which there was an increase of 28 per cent. Freights, likewise, had advanced very much; so that where the company paid formerly as low as 5s. a ton, or from 4s. 6d. to 6s. 6d. a ton, they had latterly been obliged to pay 9s., 10s., or 10s. 6d. a ton for freights. It should be remembered that this company paid no dividend for many years, and its capital had been kept down. The shareholders obtained now a dividend of not more than 6 per cent., averaging scarcely 5 per cent., which no commercial men would think was an inordinate profit; and at one time the company had run great risk of being annihilated by the competition which was encouraged by some consumers, who wanted to get their gas at 2s. or 1s. 6d. the 1000 cubic feet. Mr. Simpson concluded by assuring the deputation that, if it should be in the power of the company to reduce the price of gas, it would be done; but, situated as the company now was, he really could not hold out any immediate hope of it.

LINCOLNSHIRE WAY OF GETTING RID OF A BOARD OF HEALTH INSPECTOR.—One Saturday the town-crier of Market Rasen, Lincolnshire, delivered the following notice:—"This is to give notice, that all persons in this town having a desire for the grammar-school being established here, are requested to lose no time in collecting all the rotten eggs they possibly can find, for the purpose of saluting at the railway station, at two o'clock this afternoon, a man of American notoriety, about 5 feet 7 inches high, of dark complexion, with a good crop of black whiskers, who is now in the town going from pump to pump, drawing samples of water for the purpose of attempting to prove its impurity. Bring your rotten-eggs, and help us to cheer him off." Nearly 390 persons assembled, well provided with the necessaries, but the individual in question taking alarm, quickly returned to the station, and was no more heard of.—*Nottingham Journal.*

BURNING IN EFFIGY OF A GAS MANAGER.—Bow Common Lane was the scene of an extraordinary incident on the evening of the 20th ult. A large body of workmen, employed in a neighbouring gas work, assembled bearing an effigy, on the breast of which was inscribed a large cross, and on the head, "The Tyrant of Bow Common Slaughter House," to which a light was applied, amidst the yells and shoutings of the spectators. This unprecedented act is ascribed to the alleged tyrannical and overbearing conduct of a gas manager to the workmen employed under him, and has been commemorated by a printed card, extensively distributed amongst the persons employed in the Metropolitan gas-works.

THE SHEFFIELD UNITED GAS COMPANY.—It has been announced that the dividend to be declared at the approaching half-yearly meeting of this company, is to be at the rate of 9 per cent. per annum on the old shares, and 8 per cent. on the new ones, the latter being the maximum dividend allowed by the act.

THE TURKISH GAS COMPANIES.—The race between the representatives of these bodies, as to which should first reach the scene of its future operations, is reported to have terminated in what in sporting phraseology is called "a dead heat," and a fusion has taken place betwen the several competitors for the doubtful prize.

ROTHWELL.—This village, in the vicinity of Wakefield, is about to be lighted with gas. The works have been designed, and are to be erected, under the superintendence of Mr. Gore, of Leeds, and when completed bid fair to be a model of simplicity and economy.

Price Current.

CASTINGS, per Ton.

Average Weight of Cast Iron Gas Pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	35	51	70	89	107	126	149	177	208 lbs.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow	Newcastle.	Wales.	Yorksh., Derbysh. and Staffordsh
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Pig Iron, No. 1.	4 5 0	3 10 0	4 0 0	4 10 0	4 0 0
1¼ and 2 inches Socket Pipes	8 0 0	7 0 0	7 10 0	7 15 0	7 10 0
2½ and 3 do. do.	7 10 0	6 15 0	7 5 0	7 10 0	7 5 0
4 and 5 do. do.	7 5 0	6 10 0	7 0 0	7 5 0	7 0 0
6 inches and upwards do.	7 10 0	6 5 0	6 10 0	7 0 0	6 10 6
Retorts, 1st fusion, hot blast	7 5 0	...	7 0 0	7 5 0	7 0 0
Do. 2nd fusion, cold blast	8 0 0	...	7 5 0	7 10 0	7 5 0
Tank Plates, ¼ thick and above	7 10 0	6 10 0	7 0 0	7 5 0	7 0 0

COALS.

NEWCASTLE.	s. d.		SCOTCH CANNEL.		per ton.
Unscreened.	7 0	per ton.	Boghead .....at Leith	28 0	,,
Whitwell Primrose	7 6	,,	Kirkness.....best	23 0	,,
Pelton and Medomsley...	7 9	,,	Capeldrae, first quality	20 0	,,
Pelaw.....			Ditto, second quality	12 6	,,
Burnhope, Eighton Moor, New Peltor, Peareth, South Pelaw, Washington Hutton, and South Peareth.....[net.	8 0	,,	Lesmahago at Glasgow	25 0	,,
			Ditto at Leith	27 6	,,
			Arniston.....	22 0	,,
			Wemyss ...(at the pits)	16 0	,,
			Knightswood.....	18 0	,,
Ramsay's Newcastle Can-	14 0	,,	Methill.....	11 0	,,

SUNDRIES.

Best Newcastle fire-bricks, 60s. per 1000	Welch bar iron in London, £9.10s. per ton.
Ditto ditto clay ...12s. per ton.	Foreign spelter ..... £23. 10s. ,,
Cliff's fire-bricks at Wortley, 57s6d p1000	English block tin .....£129 ,,
Tough cake copper..... £126 per ton.	Ditto ditto refined... 135 ,,
English pig lead .....£26 to £27 ,,	Banca ditto ..... 130 ,,

WROUGHT IRON TUBING, subject to 35 per cent. Discount.

	2 inches.	1¼ inch.	1½ inch.	1 inch.	¾ inch.	½ inch.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent welded tubes, from 2 to 12 feet, per foot	1 8	1 0	0 10	0 7	0 5	0 4½
Ditto .... „ 6 in. to 18 in., each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting pieces, or long screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, springs, and elbows, wrought iron	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, wrought or cast	4 6	3 0	2 6	2 0	1 6	1 2
Iron cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing sockets, caps, plugs, and nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 2 quart	15 0	14 0	13 6	13 0	12 0	

FREIGHTS, per Ton.

Coastwise—Newcastle.		*Foreign.*	
Chatham & Roches.	7s. 0d	Boulogne.....	9s. 0d
Cork	10 6	Barcelona	30 0
Dover	7 6	Bordeaux	16 6
Dublin	12 6	Cadiz	17 6
Exeter Quay	11 0	Calais	13 6
Folkestone	7 0	Dieppe.....	10 6
Hastings.....	8 0	Genoa	32 0
London	6 9	Hamburg	10 0
Lowestoft & Yarmth	5 0	Havre	10 6
Lynn.....	6 0	Leghorn	20 0
Portsmouth	8 6	Lisbon	17 0
Plymouth	9 6	Rotterdam.....	9 6
Whitstable.....	7 0	Stettin	15 0
Weymouth.....	8 6	Trieste and Venice	36 0

Advertisements.

BRYAN DONKIN and CO.'s improved GAS VALVES have been adopted by numerous Gas Companies in England and abroad, and their advantages and great security fully proved. Very large numbers are in use. Prices from 11s. to 14s. per inch diameter. BRYAN DONKIN and Co., Engineers, near Grange-road, BERMONDSEY.

M. SHEEN, Gas and Railway Lantern Maker, 90½, Holborn Hill, begs to inform Managers of Gas-Works, &c., that she continues to contract and supply Lanterns on reasonable terms, and keep them in repair by the year.

WALTER MABON, Engineer, ARDWICK IRON WORKS, FAIRFIELD STREET, MANCHESTER, Manufacturer of IRON TANKS for Gasholders, Railway Stations, &c.

GASHOLDERS.—Extensive premises at Gorton, solely for the manufacture of Gasholders, and other heavy Wrought-Iron Structures.

GAS APPARATUS.—W. M. has an extensive assortment of patterns for Purifiers from 4 feet to 15 feet square, also round ones from 4 feet to 10 feet diameter; Scrubbers, Condensers, Washers, Columns, Girders, and Tripod Patterns, suitable for Gasholders, from 10 feet to 150 feet diameter, either Single-lift or Telescope. Contractor for Gas Works of any Magnitude. Designs, Specifications, and Estimates furnished.

WROUGHT and CAST IRON ROOFS for Railway Stations, Gas Works, Warehouses, and Sheds, prepared for Slates or for Corrugated Iron.

IRON HOUSES, either for Dwellings, Manufactories, or Public Buildings.

PIPES and VALVES, for Gas and Water, from 2 inches to 48 inches bore.

By Her Majesty's Royal Letters Patent.

JOSEPH BOULTON, PATENT DRY GAS-METER MANUFACTURER, and also Maker of his Improved WATER METERS. No. 28, BAGNIGGE-WELLS-ROAD, CLERKENWELL, adjoining the Police Office.—Late of No. 1, Coppice-row, LONDON.

Experimental and Station Meters of any size made to order on the shortest notice.—Governors, Pressure Registers, Gas-cooking Stoves, and every description of Gas Apparatus.

TO GAS COMPANIES, FITTERS, AND IRONMONGERS.

LLOYD and SUMMERFIELD, Manufacturers of CUT and FLINT GLASS Jet Moons, Globes, Hemispheres, and Chimneys of every description; Hall Lamps, Lustres, and Chandeliers of the most modern patterns. PARK GLASS WORKS, BIRMINGHAM.

RETORT AND BOILER SETTING.

FREDERICK SIMMONDS, Sen., No. 11, WELLINGTON STREET, OLD FORD ROAD, Thirty years RETORT SETTER to some of the leading London and Provincial Gas Companies, to whom he can refer, begs leave to draw attention to his economical mode of Setting Clay or Iron Retorts, &c.

F. S. will engage to provide all materials and labour, or labour only.

CAST-IRON Retorts, Socket Pipes, with Syphons and all requisite Connections, Lamp Columns, Wrought Iron Tubing, Valves, Street Lamps, Sight Holes, Furnace Doors, Ash Pans, Charging and Coke Shovels, Iron Pails and Coke Barrows, Cross Bars, Fire Pots, Pumps, Iron Borings.

PURIFIERS, CONDENSERS, and SCRUBBERS erected complete, or the materials supplied; with every description of goods in use by Gas Works, in stock, on wholesale prices, at LYNCH WHITE'S, Old Barge Iron Wharf, Upper Ground-street, LONDON.

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WILLIAM SMITH, by the improvements he has made in the Wet Meter, and which he has secured by her Majesty's Royal Letters Patent, the accuracy of their registry is rendered certain by the introduction of the adjusting slide and hydraulic, whereby a Perfect Water Level is readily obtained, and the Hydraulic precludes the possibility of abstracting water from the meter by increased pressure or otherwise, thus surmounting the great desideratum of the Wet Meter. In his Patent Equitable Gas Meter neatness and strength are combined, the backs and fronts of the case being stamped by powerful machinery out of thick plate iron (tinned or galvanized); and the internal construction is of the best metal, which will resist the action of any impurity in the gas.

Old Meters may readily have the adjusting slide and hydraulic applied, thereby having accurate measurement assured.

Station Meters, Governors, &c., made on the shortest notice.

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UNION-STREET, OLDHAM.

Station and Experimental Meters, Gas Pressure Registers, Gauges, Experimental Gasholders, Governors, Slide Valves, &c. &c.

W. and G. would respectfully call the attention of Gas Engineers and Managers to their Station-meters, having made and erected the largest in use at the present time, two of which may be seen at the Stockport and Liverpool Gas Works, on application to the respective Engineers.

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Manufacturer of GASHOLDERS, IRON ROOFS, and every description of Gas Apparatus.
ALLIANCE IRON WORKS,
CLAYTON, near MANCHESTER.

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MANUFACTURER OF GAS METERS,
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BIRMINGHAM,
(Established 1830),

Begs respectfully to call the attention of Gas Companies, Engineers, &c., to his WET GAS METER, made upon the most improved principles, the most admirable materials, and warranted to register correctly.

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PIPES, RETORTS, TANKS, GASHOLDERS, &c. on Shortest Notice.
STOURBRIDGE and NEWCASTLE FIRE GOODS.
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Contracts for Tanks, Gasholders, Roofs, Purifiers, and all descriptions of Gas Apparatus executed on the most reasonable terms. Improved Slide Valves, Steam, and Range Boilers, and Smiths' Work, of the best materials and workmanship.

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Manufactory for every description of Casting and Machinery for Gas Works and Water Works.

Warehouse in London for Cast-iron Pipes and Connections of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.

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Manufacturer of Patent Iron Tubing, Block Tin, Lead, and Composition Tubing. Cast-iron Gas and Water Pipes of all sizes, and every description of Gas Apparatus.

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WHITWELL PRIMROSE GAS

COAL.—These excellent Gas Coals are wrought from the HUTTON SEAM *only*, and can be shipped either at the South Dock, SUNDERLAND; or Old Harbour, HARTLEPOOL; or Brandling Drops, SOUTH SHIELDS; on application to the WHITWELL COAL COMPANY, Sunderland.

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O. BROTHERS and COMPANY, Manufacturers of O. Brothers's Patent, beg to state that these Retorts, being made in one entire operation, and in one piece, of any required shape, length, breadth, and height, are not liable to cracks and fissures, of which there is a just and general complaint; and consequently superior to, and cheaper than, any hitherto manufactured.

GREAT REDUCTION IN PRICES—30 per cent. cheaper than any other Clay Retorts manufactured.

Shape.	Sizes.	Length.	Thickness.	Price at Railway Station, Blackburn.	Price per foot run, of any required length, at Blackburn.
		feet.	in.	£ s. d.	s. d.
Dee.....	12 in. by 12 in.	8	2½	2 0 0	5 0
„	14 in. by 12 in.	8	2½	2 4 0	5 6
„	16 in. by 13 in.	8	2½	2 10 0	6 3
„	18 in. by 14 in	8	2½	2 16 0	7 0
„	19 in. by 13 in.	8	2½	2 16 0	7 0
„	20 in. by 14 in.	9	3¼	3 7 6	7 6
„	24 in. by 15 in.	8	2½	3 12 0	9 0
Round.....	15 in. by 15 in.	8	2½	2 10 0	6 3
„	15 in. by 15 in.	10	2½	3 2 6	6 3
„	18 in. by 18 in.	8	2½	3 0 0	7 6
Oval Retort	18 in. by 12 in.	8	2½	3 0 0	7 6

All other sizes and shapes in proportion, to order. References and further particulars may be obtained on application to the Patentee, Gas Works, BLACKBURN.

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ELEGANT CRYSTAL GLASS CHANDELIERS, FOR GAS

(Made from "REGISTERED" DESIGNS), with GLASS BRANCHES, &c.; suitable for DRAWING-ROOMS and BALL-ROOMS. The more extensive use of GAS in private dwellings has induced Messrs. OSLER to direct their particular attention to the manufacture of this class of articles—which, with a view to their general adoption, are offered at very moderate prices. Purchasers can select from a great variety of patterns, to which additions are being constantly made.

THEATRES, CONCERT, ASSEMBLY, AND BALL ROOMS LIGHTED BY ESTIMATE ON THE LOWEST TERMS.

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Hundred and Thirtieth Thousand.
ADVANTAGES
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GAS IN PRIVATE HOUSES.
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A New Edition, Revised in 1855.

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GAS IN DWELLING-HOUSES:
ITS USES, CONVENIENCES, AND ECONOMY.

Price:—1000 copies, £3. 3s.; 500 ditto, £1. 15s.; any smaller number, 7s. 6d. per 100.

A single copy of either of the above-mentioned books will be sent, on application to the Author ONLY, by payment of the postage (1d.).

These little books are written in a simple and familiar style; showing the comfort, convenience, safety, and economy of Gas. They are intended for gratuitous distribution by Gas Companies. They have already done good service, and the author is anxious still further to extend their usefulness.

The present high prices of tallow and oil are favourable to a more general adoption of gas in private houses. Let its advantages, as yielding a pure, cheap, and healthful light, be properly explained, and there will be no difficulty in getting over a few old-fashioned prejudices. Those persons who have experienced the benfits of gas-light never go back to candles or lamps.

JOHN W. PARKER AND SON,
WEST STRAND, LONDON.
Black Rock, Brighton.

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SIDE, has long been known to sell the following Castings at prices lower than any other house in London:—Socket and Flange Pipes, Bends, Branches and Tees, Syphons, Lamp-posts, Rain-water Pipes, &c.; also, Hot Water Pipes, Elbows, Tees, Cylindrical and Saddle Boilers, and every Fitting for the same. Drawings and Prices of the above on application to J. JONES, Iron Bridge Wharf, 6, BANKSIDE, near the Southwark Iron Bridge.

12,950 CUBIC FEET OF GAS,

Specific Gravity ·820, produced from a ton of BATHVILLE CANNEL COAL, a Coal identical with that named Bathgate, Boghead and Torbane Mineral.

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Are supplied to Gas Companies and the Public as the best and simplest Dry Gas Meters in use. They are acknowledged to be of first-rate workmanship and accuracy of registration.—Shears and Sons continue to supply these Meters on the most favourable terms; and they also manufacture Wet Gas Meters, to which they apply their Patent Indices.

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Beg to draw the attention of Engineers and Managers of Gas Works to the superior quality of the Article they manufacture, both in respect of the iron employed, and the perfect manner in which it is welded; in proof of which they can refer to the testimonials of the most eminent Gas Engineers, and the experience of the principal of the large Gas Companies of the kingdom. Orders promptly executed.

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is the most simple and effective machine of the kind made. It gives no appreciable oscillation or slip; works with extremely little friction; and requires no internal lubrication.

These Exhausters are in operation both in London and the Provinces, pumping from 10,000 to 70,000 cubic feet of gas per hour. They occupy very little space, and may be set either perpendicular or horizontal.

Particulars of price, &c., may be had on application to MR. ANDERSON, at the Gas Works, Botherhithe LONDON.

GAS EXPLOSIONS Prevented by

using the Tubes and Fittings Manufactured by
JOHN RUSSELL and CO.,
whose Goods are all well Tested and Warranted.
The first manufacturers of Lap-welded Flues for Locomotive and Marine Boilers.

The FIRST PRIZE of the Paris Great Exhibition was awarded to them for Gas Tubes and Fittings, and Tubes for Marine and Locomotive Boilers.

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MANUFACTORY,
THE OLD TUBE WORKS, CHURCH HILL,
WEDNESBURY, STAFFORDSHIRE.

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Vulcanized Indiarubber Hose Pipes and Tubing. Manufactory (and Warehouse), Goswell-mews, Goswell-road, London.

Gas Companies, Engineers, Gas Fitters, and the Trade generally, are respectfully informed this Tubing is now manufactured to any size, from ¼ inch bore and upwards, in 100-feet lengths, and perfectly cylindrical, either with or without a spiral wire inside.

VULCANIZED GLAZED FLEXIBLE TUBING, from ¼ inch up to 1 inch diameter, made in 24-feet lengths; or, covered with silk or worsted, up to 100 feet.

VULCANIZED HOSE, for FIRE ENGINES, BREWERS' USE, and for standing great pressures, (Rubber and Cloth combined), made to any length or size to fit the necessary screws, &c.

VULCANIZED INDIARUBBER AIR-TIGHT BAGS, made any size, for Gas Mains, with flexible tubes attached, and fitted with stopcocks complete.

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The Bank of England is fitted entirely with these Valves, from the smallest branch to the largest main pipe.

The following, among numerous testimonials, will be found very satisfactory:—

"The British Gaslight Company's Office, No. 105, Broad-street, Ratcliff, London, June 10, 1846.

"Gentlemen,—In reply to your inquiry, I have to state that 'Carter's Patent Gas Valve' has been used by this company and by the fitters of the district extensively for seven years past. It was adopted to obviate the inconvenience of setting fast, so prevalent with the conical metal plug-cocks, and has been found to answer the purpose intended.

"I have recommended its use in several provincial towns with which I am professionally connected, and have not received any complaint of its having failed in any respect of performing satisfactorily all that is required of it.—I am, gentlemen, yours respectfully,
"GEDDIS PEARSE.

"Messrs. Lambert and Son, Lambeth."

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GAS ENGINEER, MANUFACTURER OF GAS METERS, GOVERNORS,
AND ALL DESCRIPTION OF GAS APPARATUS,
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CONSUMERS' METERS at the List Price, with a Liberal Discount to Wholesale Purchasers.

THOMPSON'S BROMINE TEST, £1. 1s.
Bromine, 3s. per Ounce.

BISULPHURET OF CARBON TEST, £2. 2s.

APPARATUS FOR DETERMINING THE
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REGISTERING PRESSURE GAUGE,
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STATION METERS, PRESSURE GAUGES, PHOTOMETERS, SPECIFIC GRAVITY APPARATUS, &C.

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